

**Rathbun Lake**  
**1999 Water Quality Report**

**1. General.**

a. **Project location.** Rathbun Dam is located at approximately river mile 142.3 on the Chariton River, 5 miles north of Centerville, Iowa. The project watershed encompasses 549 square miles and lies within Appanoose County, Iowa.

b. **Authorized project purposes.** Flood control, water supply, navigation (on the Missouri River), and water quality are the primary project purposes; equally important, however, are its fish and wildlife resources and recreation benefits.

c. **Pertinent data.**

	Surface Elevation (ft. above m.s.l.)	Current Capacity (1,000 A.F.)	Surface Area (acres)	Shoreline (miles)
Pools				
Flood Control	926.0	345.5	21,000	
Multipurpose	904.0	190.7*	11,000	155
Inactive		8.6**		
Total		536.2		

Total Drainage Area: 549 sq. miles

Average Annual Inflow: 355,704 acre-feet

\* Based on most recent hydrographic survey.

\*\* Contained in multipurpose pool

**2. Activities and studies of the year.**

The Water Quality Unit (PM-PR-W) and Rathbun Lake Project (OF-RA) continued to cooperate with the Iowa State University Limnology Laboratory (ISU) and local, state, and other Federal agencies in carrying out a monitoring plan for the Chariton River watershed and Rathbun Lake. The 1999 monitoring plan involved the PM-PR-W and OF-RA in monthly sampling of four lake stations, three beaches, two marinas, and the outlet. Ambient profiling of temperature, dissolved oxygen (DO), conductivity, pH, and oxidation reduction potential (orp) or redox; measurement of photic zone and secchi depths; surface, mid-depth, and near bottom water sample collections; and sediment sampling were performed. Monthly sampling of 14 tributaries was carried out by ISU personnel. The latter also measured surface water temperature, DO, conductivity, pH, and discharge and performed fecal coliform, total coliform, enterococci, E.

coli, chloride, silica, and caffeine analyses. PM-PR-W performed turbidity, suspended solids, total alkalinity, and immunoassay herbicide analyses on stream and lake samples and fecal coliform and chlorophyll analyses on lake samples. In addition, the Chemical and Materials Quality Assurance Laboratory (CMQAL) performed nitrogen and phosphorus group, sulfate, chemical oxygen demand, total dissolved solids, volatile solids, total and dissolved iron, total and dissolved manganese, total and dissolved organic carbon, and gas chromatographic (GC) pesticide analyses on stream and lake samples. CMQAL also analyzed sediment and elutriate samples for the above parameters.

The ultimate goal of the cooperative effort is to implement a watershed management plan, which will reduce point and non-point pollution entering the reservoir. The local sponsor of the project is the Chariton Valley Resource Conservation and Development (RC&D) Program administered by the Natural Resources Conservation Service (NRCS) with the support of other Federal agricultural agencies. Major funding for implementation of the plan is by an EPA Clean Water Act 319 Grant. In support of this effort, PM-PR-W is contributing its field and analytical services and funding the analytical work of CMQAL.

The OF-RA is to be commended for its continued support of water quality monitoring of Rathbun Lake and its tributaries. The OF-RA personnel deserving special recognition include Messrs. Paul Egeland and William Duey.

### **3. Existing conditions.**

a. **Inflow.** Most of the tributaries exhibited eutrophic to hypereutrophic nutrient levels and elevated herbicide levels. The high nutrient and herbicide concentrations continued to be associated with the highest total suspended solids (TSS) and turbidities indicating the significant impact of storm run-off events on stream water quality. Total nitrogen (TN) concentrations, comprised of ammonia, nitrite, nitrate, and total Kjeldahl nitrogen, frequently exceeded the EPA generalized stream eutrophy criterion of 1 mg/L. Similarly, total phosphorus (TP) concentrations generally exceeded the stream eutrophy criterion of 0.1 mg/L. Atrazine concentrations frequently exceeded the EPA criterion for the protection of aquatic life (1 ug/L) and the maximum contaminant level (MCL) for drinking water supplies (3 ug/L). Also cyanazine concentrations exceeded the maximum contaminant level goal (MCLG) for drinking water supplies (1 ug/L) on some occasions.

Two sampling stations, RA-32 and RA-33, on the Chariton River near Last Chance, Iowa, exhibited extremely high nutrient levels particularly in March and June surveys. Total nitrogen concentrations were within eutrophic to hypereutrophic ranges throughout the ten survey periods. Mean TN concentrations were nearly identical (3.45 and 3.46 mg/L), and maximum TN concentrations ranged from 8.74 mg/L to 9.75 mg/L at RA-32 and RA-33, respectively (Table 1). The total phosphorus concentrations were also well in excess of the generalized stream eutrophy criterion of 0.1 mg/L during nine of the ten surveys. Mean TP concentrations were also identical at 0.46 and 0.47 mg/L, and maximum concentrations ranged from 1.36 mg/L to 1.70 mg/L at RA-32 and RA-33, respectively. (A compilation of all stream data is presented in the Appendix, Tables 1-6).

Table 1. 1999 Stream Statistical Data

STATION		TN mg/L	TP mg/L	TSS mg/L	TURB NTU	ATZ ug/L	METO ug/L	CYAN ug/L	ALA ug/L
RA-12	Mean	1.63	0.37	256	178	4.19	0.91	0.06	0.09
South Fork	Min.	0.2	0.1	2.6	7.8	0.08	<0.05	<0.04	<0.05
Chariton R	Max.	5.44	1.35	1492	1206	25.7	4.81	0.32	0.38
RA-15	Mean	2.82	0.48	289	204	5.76	1.75	0.31	0.12
Chariton R	Min.	0.74	0.11	21	21	0.17	0.14	<0.04	<0.05
	Max.	6.18	1.18	1219	870	25.2	4.01	1.42	0.28
RA-32	Mean	3.45	0.46	234	182	9.49	4.24	0.28	0.53
Chariton R	Min.	0	0.17	9.3	15	0.37	0.27	0.05	0.06
	Max.	8.74	1.36	1145	1053	56.2	24.7	1.58	1.9
RA-33	Mean	3.46	0.47	202	226	8.79	3.7	0.2	0.13
Chariton R	Min.	0	0.14	9.9	5	0.16	<0.05	<0.04	<0.05
	Max.	9.75	1.7	1135	1660	63.4	25.7	0.88	0.55
RA-34	Mean	1.86	0.23	43	35	3.83	1.17	0.46	0.67
Unnamed Ck	Min.	0.61	0.07	17	16	0.23	0.14	0.11	0.27
	Max.	5.38	0.44	71	93	18.8	3.53	1.2	1.03
RA-35	Mean	2.25	0.33	141	136	6.02	1.1	0.11	0.16
South Fork	Min.	0.65	0.1	17	20	0.09	<0.05	<0.04	<0.05
Chariton R	Max.	7.81	1.07	718	743	35.1	4.76	0.48	0.47
RA-36	Mean	2.07	0.31	113	92	5.29	1.58	0.09	0.1
Nine Mile Ck	Min.	0.37	0.09	13	5	0.08	0.07	<0.04	<0.05
	Max.	7.28	0.45	663	573	27.7	10.5	0.36	0.48
RA-37	Mean	1.66	0.27	113	65	4.59	0.85	0.08	0.04
Jordan Ck	Min.	0.35	0.05	3.9	6.5	0.07	<0.05	<0.04	<0.05
	Max.	3.66	0.73	510	275	30.1	4.5	0.33	0.28
RA-38	Mean	1.6	0.3	173	105	5.11	1	0.11	0.07
Walker Ck	Min.	0.23	0.06	11	12	0.07	<0.05	<0.04	<0.05
	Max.	5.34	0.56	439	295	27.4	4.65	0.45	0.32
RA-39	Mean	1.76	0.33	122	80	2.39	0.48	0.06	0.04
Jackson Ck	Min.	0.78	0.1	18	15	0.1	<0.05	<0.04	<0.05
	Max.	3.71	0.57	452	316	17.6	2.04	0.28	0.19
RA-40	Mean	2.6	0.4	176	110	4.89	2.49	0.08	0.05
Honey Ck	Min.	0.88	0.15	9	12	0.06	<0.05	<0.04	<0.05
	Max.	6.14	1.1	433	434	34.1	19.4	0.43	0.3
RA-41	Mean	2.52	0.49	398	309	6.47	1.01	0.1	0.06
Wolf Ck	Min.	0.67	0.11	30	23	0.07	<0.05	<0.04	<0.05
	Max.	8.62	2.19	2508	2204	41.5	4.63	0.36	0.22
RA-42	Mean	3.37	0.43	248	183	11.72	4.04	0.16	0.13
Five Mile Ck	Min.	0.55	0.17	22	19	0.1	<0.05	<0.04	<0.05
	Max.	7.92	1.17	782	821	53.4	20.1	0.56	0.48
RA-43	Mean	4.04	0.2	45	49	9.26	4.33	0.37	0.23
Honey Ck	Min.	1.29	0.1	15	11	0.79	0.11	0.07	0.1
	Max.	6.69	0.32	113	159	48.5	19.4	1.23	0.53

Atrazine concentrations during June and July at the two upper Chariton River stations were extremely high, exceeding both the aquatic life (1 ug/L) and water supply (3 ug/L) criteria. The mean, minimum, and maximum atrazine concentrations were 9.49 ug/L, 0.37 ug/L, and 56.2 ug/L at RA-32 and 8.79 ug/L, 0.16 ug/L, and 63.40 ug/L at RA-33, respectively. Metolachlor concentrations were also very high in the above survey periods; however, since no MCL has been established for the herbicide, the seriousness of the levels can not be judged. The mean, minimum, and maximum metolachlor concentrations were 4.24 ug/L, 0.44 ug/L, and 24.7 ug/L at RA-32 and 3.70 ug/L, <0.05 ug/L, and 25.7 ug/L at RA-33, respectively. Cyanazine levels at RA-32 exceeded the MCLG of 1 ug/L during the one June survey period. The mean, minimum, and maximum cyanazine concentrations were 0.28 ug/L, 0.05 ug/L, and 1.58 ug/L at RA-32 and 0.20 ug/L, <0.04 ug/L, and 0.88 ug/L at RA-33, respectively. Alachlor concentrations in the two reaches did not exceed the MCL (2 ug/L) during 1999 surveys. The mean, minimum, and maximum alachlor concentrations were 0.53 ug/L, 0.06 ug/L, and 1.90 ug/L at RA-32 and 0.13 ug/L, <0.05 ug/L, and 0.55 ug/L at RA-33, respectively.

Total suspended solids (TSS) concentrations in the reaches near Last Chance were highly variable during the 1999 survey periods. Mean, minimum, and maximum TSS concentrations were 234 mg/L, 9.3 mg/L, and 1,145 mg/L at RA-32 and 202 mg/L, 9.9 mg/L, and 1,135 mg/L at RA-33, respectively. Corresponding turbidities were equally variable, varying from clear during low flow periods to excessively turbid during storm run-off events. (Note- Classifications for turbidity and TSS are presented in Table 2.) Mean, minimum, and maximum turbidities were 182 NTU, 15 NTU, and 1,053 NTU at RA-32 and 226 NTU, 5 NTU, and 1,660 NTU at RA-33, respectively.

Table 2. Classifications for Turbidity and Total Suspended Solids

Turbidity	Low	< 15 NTU (Clear)
	Moderately Low	15-30 NTU (Moderately Clear)
	Moderately High	30-40 NTU (Slightly Turbid)
	High	> 50 NTU (Turbid)
	Excessively High	> 100 NTU (Highly Turbid)
Total Suspended Solids	Low	< 25 mg/L
	Moderate	25-50 mg/L
	High	50-100 mg/L
	Very High	> 100 mg/L

The Chariton River further downstream near Chariton, Iowa, (RA-15) exhibited only slightly lower nutrient and herbicide levels. The mean, minimum, and maximum TN concentrations were 2.82 mg/L, 0.74 mg/L, and 6.18 mg/L, respectively. The TN concentration in June was more than six times the generalized stream eutrophy criterion. The TP concentrations also continued to exceed the generalized stream eutrophy criterion (0.1 mg/L) with mean, minimum, and maximum of 0.48 mg/L, 0.11 mg/L, and 1.18 mg/L, respectively. Highest concentrations were noted in June in association with storm run-off.

Atrazine concentrations at RA-15 exceeded the MCL (3 ug/L) in June and July. Mean, minimum, and maximum atrazine concentrations were 5.76 ug/L, 0.29 ug/L, and 25.20 ug/L, respectively. Metolachlor levels were also elevated during the above months; mean, minimum, and maximum concentrations for the ten survey periods were 1.75 ug/L, 0.14 ug/L, and 9.20 ug/L, respectively. Cyanazine concentrations exceeded the MCLG in one June survey period. Mean, minimum, and maximum concentrations were 0.31 ug/L, <0.04 ug/L, and 1.42 ug/L, respectively. Alachlor levels in this reach never exceeded the MCL with mean, minimum, and maximum concentrations of 0.12 ug/L, <0.05 ug/L, and 0.23 ug/L, respectively.

Total suspended solids and turbidity at RA-15 were also highly variable during the 1999 survey periods. Mean, minimum, and maximum TSS concentrations were 289 mg/L, 21 mg/L, and 1,219 mg/L, respectively. Turbidity mean, minimum, and maximum levels were 204 NTU, 21 NTU, and 870 NTU, respectively.

The South Fork of the Chariton River near Cambria (RA-35) also exhibited extremely high nutrient and herbicide levels in 1999. The TN and TP concentrations were hypereutrophic during June storm run-off events. Mean, minimum, and maximum TN concentrations for the nine survey periods were 2.25 mg/L, 0.65 mg/L, and 7.81 mg/L, respectively. The TP concentrations equaled or exceeded the generalized stream eutrophy criterion (0.1 mg/L) in all survey periods. The mean, minimum, and maximum TP concentrations were 0.33 mg/L, 0.10 mg/L, and 1.07 mg/L, respectively.

Atrazine concentrations at RA-35 also exceeded the MCL (3 ug/L) in June. Mean, minimum, and maximum atrazine concentrations were 6.02 ug/L, 0.09 ug/L, and 35.10 ug/L, respectively. Highest concentrations of the other herbicides were also present in June surveys. Mean, minimum, and maximum metolachlor concentrations were 1.10 ug/L, <0.05 ug/L, and 4.76 ug/L, respectively. Mean, minimum, and maximum cyanazine concentrations were 0.11 ug/L, <0.04 ug/L, and 0.48 ug/L, respectively. Alachlor concentrations were quite low in the reach with mean, minimum, and maximum of 0.16 ug/L, <0.05 ug/L, and 0.47 ug/L, respectively.

The reach represented by RA-35 also exhibited extremely variable TSS. Mean, minimum, and maximum TSS concentrations were 141 mg/L, 17 mg/L, and 718 mg/L, respectively. Corresponding turbidities were 136 NTU, 20 NTU, and 743 NTU, respectively. The latter was present in the June storm run-off.

The South Fork of the Chariton River further downstream near Promise City (RA-12) exhibited similar nutrient and herbicide levels with peaks in June. The mean, minimum, and maximum TN concentrations were 1.63 mg/L, 0.20 mg/L, and 5.44 mg/L, respectively. Total phosphorus concentrations exceeded the generalized stream eutrophy criterion (0.1 mg/L) in 80 percent of the surveys. The mean, minimum, and maximum TP concentrations were 0.37 mg/L, 0.10 mg/L, and 1.35 mg/L, respectively.

June atrazine concentrations were also extremely high at RA-12. The mean, minimum, and

maximum atrazine concentrations for the 10 survey periods were 4.19 ug/L, 0.09 ug/L, and 25.70 ug/L, respectively. Mean, minimum, and maximum metolachlor concentrations were 0.91 ug/L, <0.05 ug/L, and 4.81 ug/L, respectively. Mean, minimum, and maximum cyanazine concentrations were 0.06 ug/L, <0.04 ug/L, and 0.32 ug/L, respectively. Alachlor concentrations remained low, however, with a mean, minimum, and maximum of 0.09 ug/L, <0.05 ug/L, and 0.38 ug/L, respectively.

Total suspended solids at RA-12 ranged from 2.6 mg/L to 1,492 mg/L with a mean concentration for 10 surveys of 256 mg/L. Corresponding turbidities ranged from 7.8 NTU to 1,206 NTU with a mean of 178 NTU.

Nine Mile Creek near Cambria (RA-36) also exhibited extremely high TN concentrations. The creek's 1999 mean, minimum, and maximum TN were 2.07 mg/L, 0.37 mg/L, and 7.28 mg/L, respectively. The latter concentration, which was present in March, was within a hypereutrophic range indicative of excessive nutrient loading. Total phosphorus concentrations were also extremely high and met or exceeded the EPA generalized stream eutrophy criterion of 0.1 mg/L during nine of the survey periods. The mean, minimum, and maximum TP concentrations in Nine Mile Creek were 0.31 mg/L, 0.09 mg/L, and 0.90 mg/L, respectively. The maximum concentration in June was also indicative of hypereutrophic nutrient conditions.

Atrazine concentrations at RA-36 were also extremely high and far in excess of established criteria for aquatic life (1 ug/L) and drinking water supplies (3 ug/L) during storm run-off events. The 1999 mean, minimum, and maximum atrazine concentrations were 5.29 ug/L, 0.08 ug/L, and 27.70 ug/L, respectively. Even without an established MCL, the metolachlor concentrations also appeared to be high in storm run-off. The metolachlor mean, minimum, and maximum concentrations were 1.58 ug/L, 0.07 ug/L, and 10.50 ug/L, respectively. In contrast, cyanazine concentrations were well below the 1 ug/L MCLG for drinking water supplies with mean, minimum, and maximum of 0.09 ug/L, <0.04 ug/L, and 0.36 ug/L, respectively. Similarly, alachlor levels in Nine Mile Creek were moderately low in comparison to the established MCL of 2 ug/L with mean, minimum, and maximum concentrations of 0.10 ug/L, <0.05 ug/L, and 0.48 ug/L, respectively.

Total suspended solids at RA-36 continued to reflect the highly variable nature of sediment loading. Mean, minimum, and maximum TSS concentrations were 113 mg/L, 6.9 mg/L, and 663 mg/L, respectively, for the 10 survey periods. Turbidities ranged from 5 NTU to 573 NTU with a mean of 92 NTU.

Jordan Creek near Bethlehem (RA-37) also exhibited elevated nutrient levels during 1999. Mean, minimum, and maximum TN concentrations were 1.66 mg/L, 0.35 mg/L, and 5.20 mg/L, respectively. The TP concentrations exceeded the generalized stream eutrophy criterion in 70 percent of the surveys. Mean, minimum, and maximum TP concentrations were 0.27 mg/L, 0.05 mg/L, and 0.73 mg/L, respectively.

Significant amounts of herbicides were only present in Jordan Creek during the June survey periods. Atrazine concentrations for the month exceeded the MCL. The 1999 mean, minimum,

and maximum atrazine concentrations were 4.59 ug/L, 0.07 ug/L, and 30.10 ug/L, respectively. Mean, minimum, and maximum metolachlor concentrations were 0.85 ug/L, <0.05 ug/L, and 4.50 ug/L, respectively. Cyanazine mean, minimum, and maximum concentrations were 0.08 ug/L, <0.04 ug/L, and 0.33 ug/L, respectively. Alachlor mean, minimum, and maximum concentrations were 0.04 ug/L, <0.05 ug/L, and 0.28 ug/L, respectively.

Total suspended solids in Jordan Creek during 1999 ranged from 3.9 mg/L to 510 mg/L. The mean concentration for the 10 surveys was 113 mg/L. Corresponding turbidities ranged from 6.5 NTU to 275 NTU with a mean of 65 NTU.

Walker Branch near Confidence (RA-38) exhibited similar nutrient and herbicide levels in 1999. Moderately eutrophic to hypereutrophic TN levels were present during the 1999 surveys. Highest concentrations were noted in March and June in association with storm run-off. Mean, minimum, and maximum TN concentrations were 1.60 mg/L, 0.23 mg/L, and 5.34 mg/L, respectively. The TP levels also exceeded the established eutrophy criterion (0.1 mg/L) in seven of the ten surveys. Mean, minimum, and maximum TP concentrations were 0.30 mg/L, 0.06 mg/L, and 0.56 mg/L, respectively.

Only atrazine concentrations in the June and August surveys exceeded the 3 ug/L MCL. Mean, minimum, and maximum atrazine concentrations were 5.11 ug/L, 0.07 ug/L, and 27.40 ug/L, respectively. Metolachlor concentrations also were elevated in the June surveys. Mean, minimum, and maximum concentrations were 1.00 ug/L, <0.05 ug/L, and 4.65 ug/L, respectively. Cyanazine and alachlor concentrations were quite low in Walker Branch again in 1999. Mean, minimum, and maximum concentrations were 0.1 ug/L, <0.04 ug/L, and 0.45 ug/L for cyanazine and 0.07 ug/L, <0.05 ug/L, and 0.32 ug/L for alachlor, respectively.

Total suspended solids in Walker Branch during seven survey periods ranged from 11 mg/L in low flow periods to 439 mg/L in June storm runoff. The 1999 mean TSS concentration was 173 mg/L. Corresponding turbidities ranged from 12 NTU to 295 NTU with a mean of 105 NTU.

Jackson Creek near Bridgeport (RA-39) exhibited very similar nutrient and herbicide levels to the above creeks during 1999. The TN concentrations were quite high in March and June surveys, but within an acceptable range during the remaining eight survey periods. The mean, minimum, and maximum TN concentrations were 1.76 mg/L, 0.78 mg/L, and 3.71 mg/L, respectively. Total phosphorus concentrations met or exceeded the generalized stream eutrophy criterion in all survey periods. The March, June, and October TP concentrations were hypereutrophic. Mean, minimum, and maximum TP concentrations for the year were 0.33 mg/L, 0.10 mg/L, and 0.57 mg/L, respectively.

Herbicide concentrations in Jackson Creek were elevated only during the June surveys. Atrazine mean, minimum, and maximum concentrations for 1999 were 2.39 ug/L, 0.10 ug/L, and 17.60 ug/L, respectively. Mean, minimum, and maximum concentrations for the remaining herbicides were metolachlor, 0.48 ug/L, <0.05 ug/L, and 0.28 ug/L; cyanazine, 0.06 ug/L, <0.04 ug/L, and 0.28 ug/L; and alachlor, 0.04 ug/L, <0.05 ug/L, and 0.19 ug/L, respectively.

Total suspended solids in Jackson Creek ranged from 18 mg/L to 452 mg/L. The mean concentration for 10 surveys was 122 mg/L. Corresponding turbidities ranged from 15 NTU to 316 NTU. High nutrient and herbicide concentrations continued to be associated with the highest TSS concentrations indicating the significant impact of storm run-off events on stream water quality.

Honey Creek near Melrose (RA-40) exhibited slightly higher nutrient and herbicide levels than Jackson Creek. March and June TN concentrations were again hypereutrophic. Mean, minimum, and maximum TN concentrations for the 10 survey periods were 2.60 mg/L, 0.88 mg/L, and 6.14 mg/L, respectively. Total phosphorus concentrations exceeded the stream eutrophy criterion in all survey periods with highest concentrations in March. The mean, minimum, and maximum TP concentrations were 0.40 mg/L, 0.18 mg/L, and 1.10 mg/L, respectively.

Herbicide concentrations in Honey Creek also exhibited seasonal highs in June. The atrazine concentration in June was 10 times the MCL. Mean, minimum, and maximum atrazine concentrations were 4.89 ug/L, 0.06 ug/L, and 34.10 ug/L, respectively. Mean, minimum, and maximum concentrations for the remaining herbicides were metolachlor, 2.49 ug/L, <0.05 ug/L, and 19.40 ug/L; cyanazine, 0.08 ug/L, <0.04 ug/L, and 0.43 ug/L; and alachlor, 0.05 ug/L, <0.05 ug/L, and 0.30 ug/L, respectively.

Total suspended solids in Honey Creek ranged from 9 mg/L to 433 mg/L during 10 surveys in 1999. The mean concentration was 176 mg/L. Corresponding turbidities ranged from 12 NTU in low flow periods to 434 NTU in the high flows in June. The 1999 mean was 110 NTU.

Wolf Creek near Chariton (RA-41) was much like Jackson Creek in exhibiting elevated levels of nutrients during storm run-off events. Hypereutrophic TN levels were present in both March and June. The mean, minimum, and maximum TN concentrations were 2.52 mg/L, 0.67 mg/L, and 8.62 mg/L, respectively. The TP concentrations exceeded the stream eutrophy criterion (0.1 mg/L) in all 10 surveys. The TP mean, minimum, and maximum concentrations were 0.49 mg/L, 0.11 mg/L, and 1.10 mg/L, respectively.

Atrazine concentrations in Wolf Creek exceeded the 3 ug/L MCL in the June surveys. The 1999 mean, minimum, and maximum atrazine concentrations were 6.47 ug/L, 0.07 ug/L, and 41.50 ug/L, respectively. The three other common herbicides were elevated in the same surveys. The mean, minimum, and maximum concentrations were as follows: metolachlor, 1.01 ug/L, <0.05 ug/L, and 4.63 ug/L; alachlor, 0.06 ug/L, <0.05 ug/L, and 0.22 ug/L; and cyanazine, 0.10 ug/L, <0.04 ug/L, and 0.36 ug/L, respectively.

Wolf Creek TSS concentrations ranged from 30 mg/L to 2,508 mg/L. The mean for 10 surveys was 398 mg/L. Corresponding turbidities ranged from 23 NTU to 2,204 NTU. The 1999 mean concentration was 309 NTU. Highest nutrient and herbicide levels were again associated with the maximum TSS concentrations. Based on the observed turbidities and suspended solids, Wolf Creek would seem to be a prime candidate for erosion control measures.

An unnamed tributary near Plano (RA-34) exhibited slightly lower nutrient, herbicide, and TSS levels than those noted at the other stream stations. Nevertheless, the TN concentrations (mean, minimum, and maximum were 1.86 mg/L, 0.61 mg/L, and 5.38 mg/L, respectively) exceeded the eutrophy criterion in 62% of the surveys. Total phosphorus concentrations (mean, minimum, and maximum were 0.23 mg/L, 0.07 mg/L, and 0.44 mg/L, respectively) exceeded the stream eutrophy criterion (0.1 mg/L) in six of the eight surveys.

Highest herbicide concentrations were present in March, May and June. Atrazine levels exceeded the MCL in June. Mean, minimum, and maximum concentrations for the year were 3.83 ug/L, 0.23 ug/L, 18.80 ug/L, respectively. Metolachlor mean, minimum, and maximum concentrations were 1.17 ug/L, 0.14 ug/L, and 3.53 ug/L, respectively. Cyanazine exceeded the MCLG in May only. Its mean, minimum, and maximum for 1999 were 0.46 ug/L, 0.06 ug/L, and 1.20 ug/L, respectively. Alachlor mean, minimum, and maximum concentrations were well below the 2 ug/L MCL at 0.67 ug/L, 0.27 ug/L, and 1.03 ug/L, respectively.

Surveys of RA-34 during 1999 revealed TSS concentrations ranging from 17 mg/L to 86 mg/L, indicating the stream was not a significant contributor to the sediment loading of the lake. The mean 1999 concentration was 43 mg/L. Corresponding turbidities ranged from 16 NTU to 93 NTU with a mean of 35 NTU.

In contrast, Five Mile Creek near Derby (RA-42) exhibited some of the highest levels of nutrients, herbicides, and TSS in 1999. The TN concentrations exceeded the eutrophy criterion (1 mg/L) in 89% of the surveys. Mean, minimum, and maximum concentrations were 3.37 mg/L, 0.55 mg/L, and 7.92 mg/L, respectively. The TP concentrations exceeded the eutrophy criterion (0.1 mg/L) in all survey periods. The mean, minimum, and maximum TP concentrations were 0.43 mg/L, 0.17 mg/L, and 1.17 mg/L, respectively.

As a result of the extremely high levels in June, Five Mile Creek exhibited the highest mean annual atrazine concentration (11.72 ug/L) of any stream surveyed. Concentrations ranged from 0.05 ug/L to 53.40 ug/L. The latter was again associated with the first storm run-off following application. Metolachlor concentrations were also very high in June (20.1 ug/L) and contributed to the mean annual concentration of 4.04 ug/L. While concentrations of the remaining two herbicides also peaked in June, the levels were far below established MCLs. The mean, minimum, and maximum concentrations were 0.16 ug/L, <0.04 ug/L, and 0.56 ug/L for cyanazine and 0.13 ug/L, <0.05 ug/L, and 0.48 ug/L for alachlor, respectively.

Total suspended solids in Five Mile Creek ranged from 22 mg/L to 782 mg/L with a mean concentration of 248 mg/L in 1999. Corresponding turbidities ranged from 19 NTU to 821 NTU with a mean of 183 NTU.

The final stream station surveyed in 1999 was the lower Honey Creek (RA-43), which is tributary to the Honey Creek arm of the lake. Data for May-September suggest the small intermittent stream also contained elevated nutrient levels. Total nitrogen exceeded the stream eutrophy criterion in all periods with flow. Mean, minimum, and maximum TN concentrations

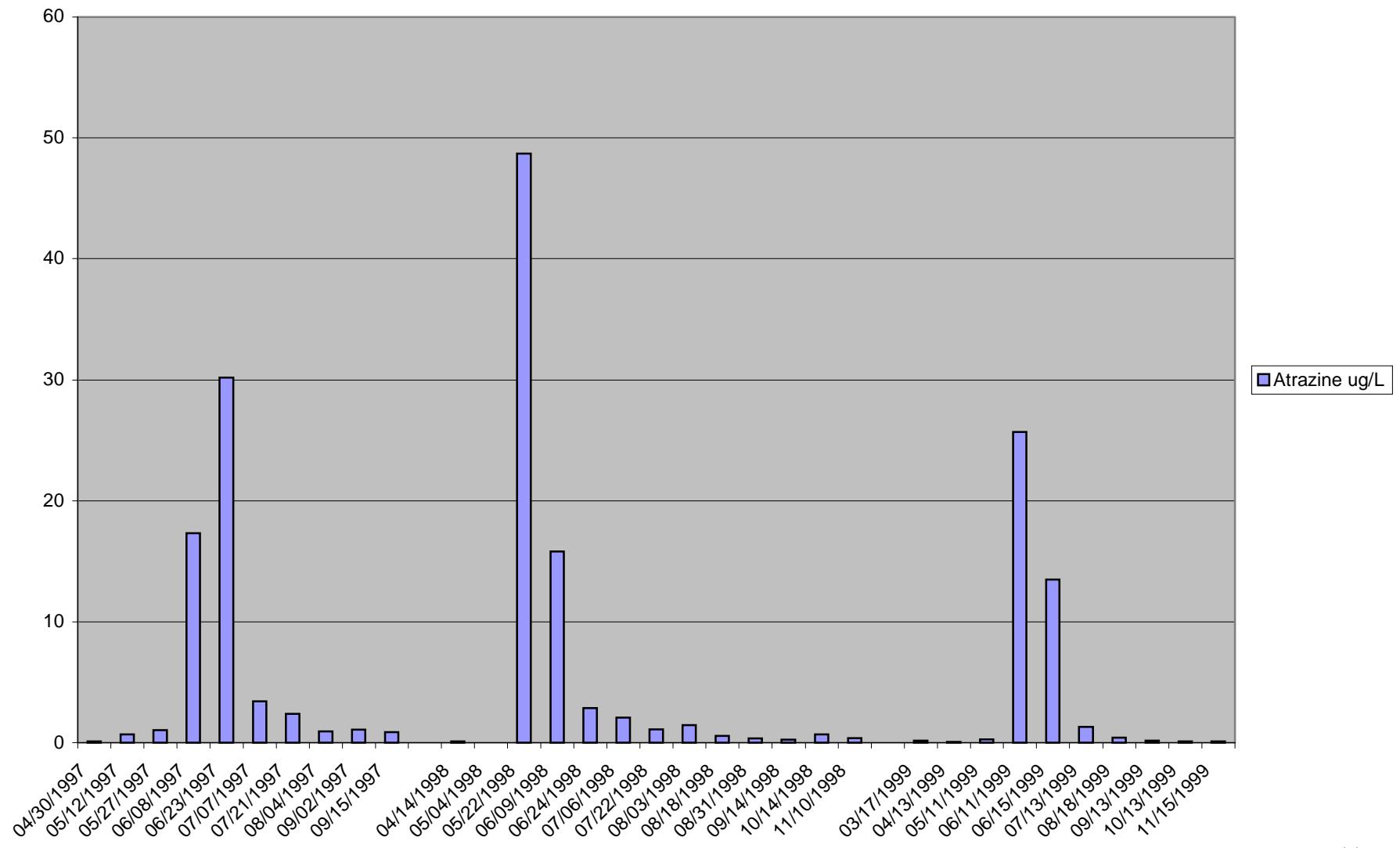
were 4.04 mg/L, 1.29 mg/L, and 6.69 mg/L, respectively. Total phosphorus concentrations also equaled or exceeded the stream eutrophy criterion in all survey periods. Mean, minimum, maximum TP concentrations were 0.20 mg/L, 0.10 mg/L, and 0.32 mg/L, respectively.

Atrazine concentrations in Honey Creek during June (48.50 ug/L) were significantly higher than the 3 ug/L MCL. The mean concentration for the six surveys was 9.26 ug/L. Metolachlor concentrations were also elevated in June (19.40 ug/L) contributing to the mean annual concentration of 4.33 ug/L. The remaining herbicides were present in low concentrations. Mean, minimum, and maximum concentrations were cyanazine, 0.37 ug/L, 0.07 ug/L, and 1.23 ug/L and alachlor, 0.23 ug/L, 0.10 ug/L, and 0.53 ug/L, respectively.

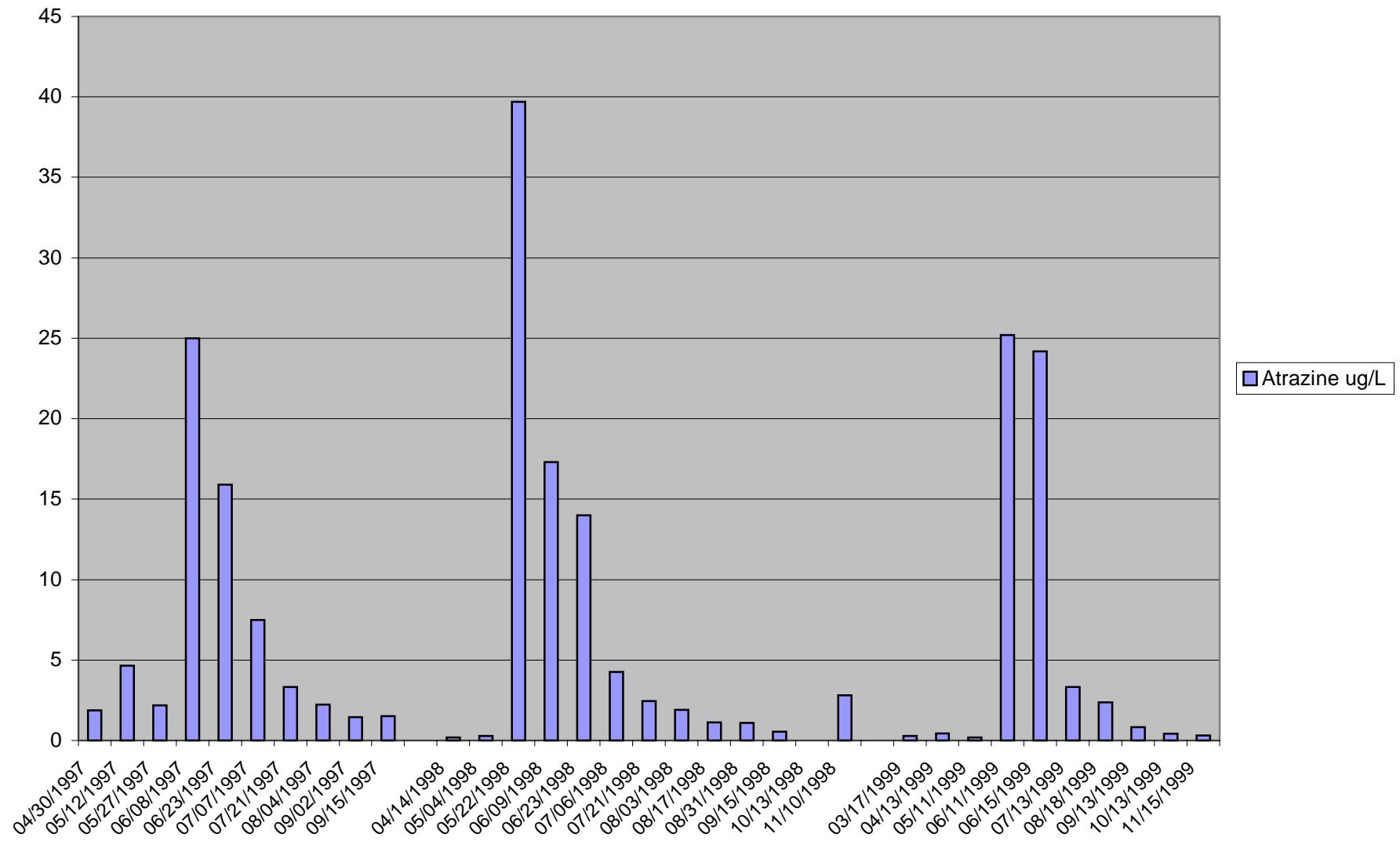
Total suspended solids in Honey Creek ranged from 15 mg/L to 113 mg/L. The mean concentration for the six survey periods was 45 mg/L. Corresponding turbidities ranged from 11 NTU to 159 NTU with a mean concentration of 49 NTU.

Because of the strong interest in atrazine concentrations in the tributaries to Rathbun Lake, figures 1-14 are presented showing the levels of the herbicide over the last three sampling years. High concentrations were observed in one or two major events in association with storm run-off during May and June. Highest concentrations (>80 ug/L) were present in the Chariton River (RA-33 and RA-32) and Nine Mile Creek (RA-36). The next highest concentrations (>50 ug/L) were present in Five Mile Creek (RA-42). Concentrations above 40 ug/L were present in the South Fork Chariton River (RA-12 and RA-35), Wolf Creek (RA-41), and both Honey creeks (RA-40 and RA-43).

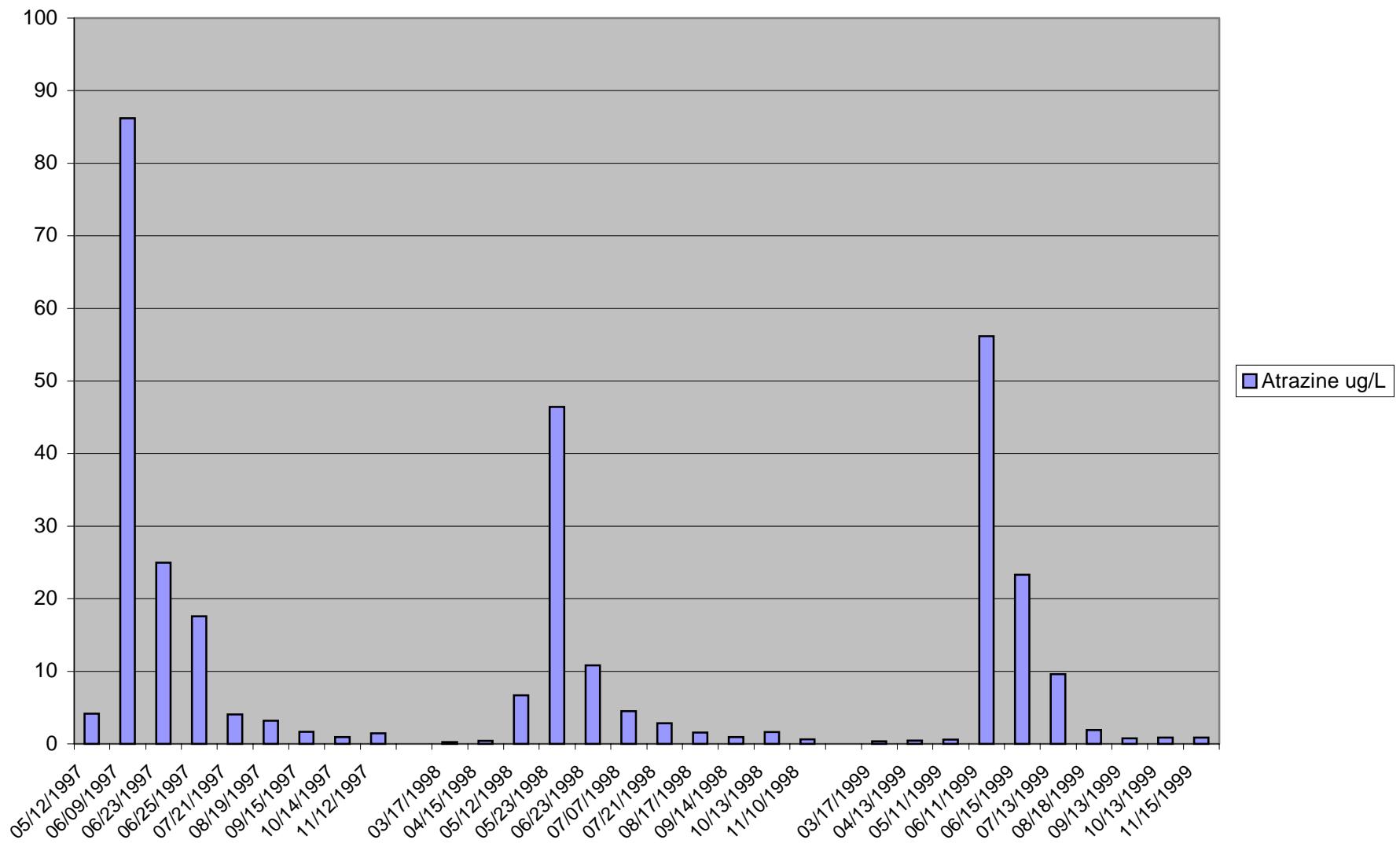
**Figure 1. South Fork Chariton River (RA-12) Atrazine Concentrations, 1997-1999**



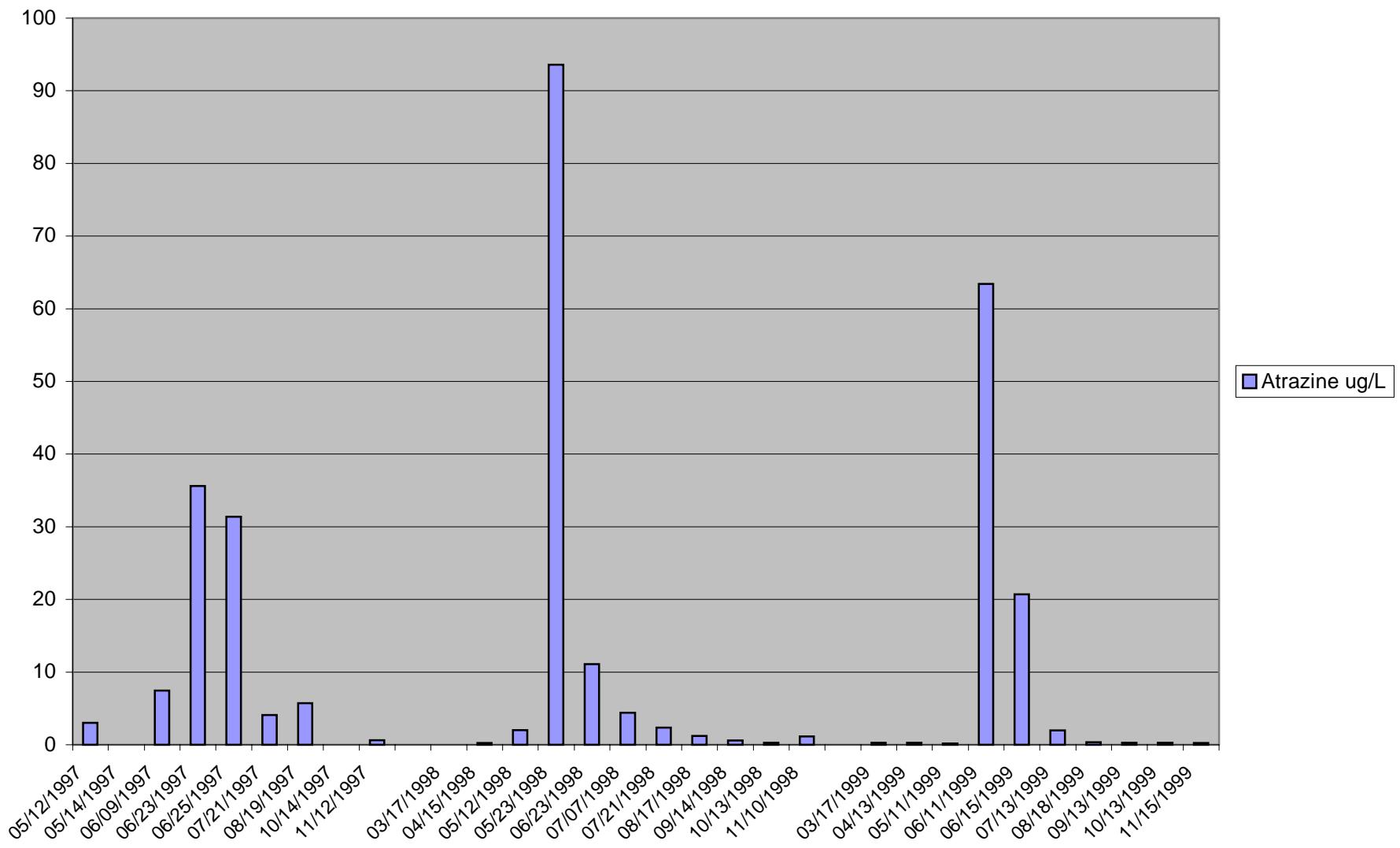
**Figure 2. Chariton River (RA-15) Atrazine Concentrations, 1997-1999**



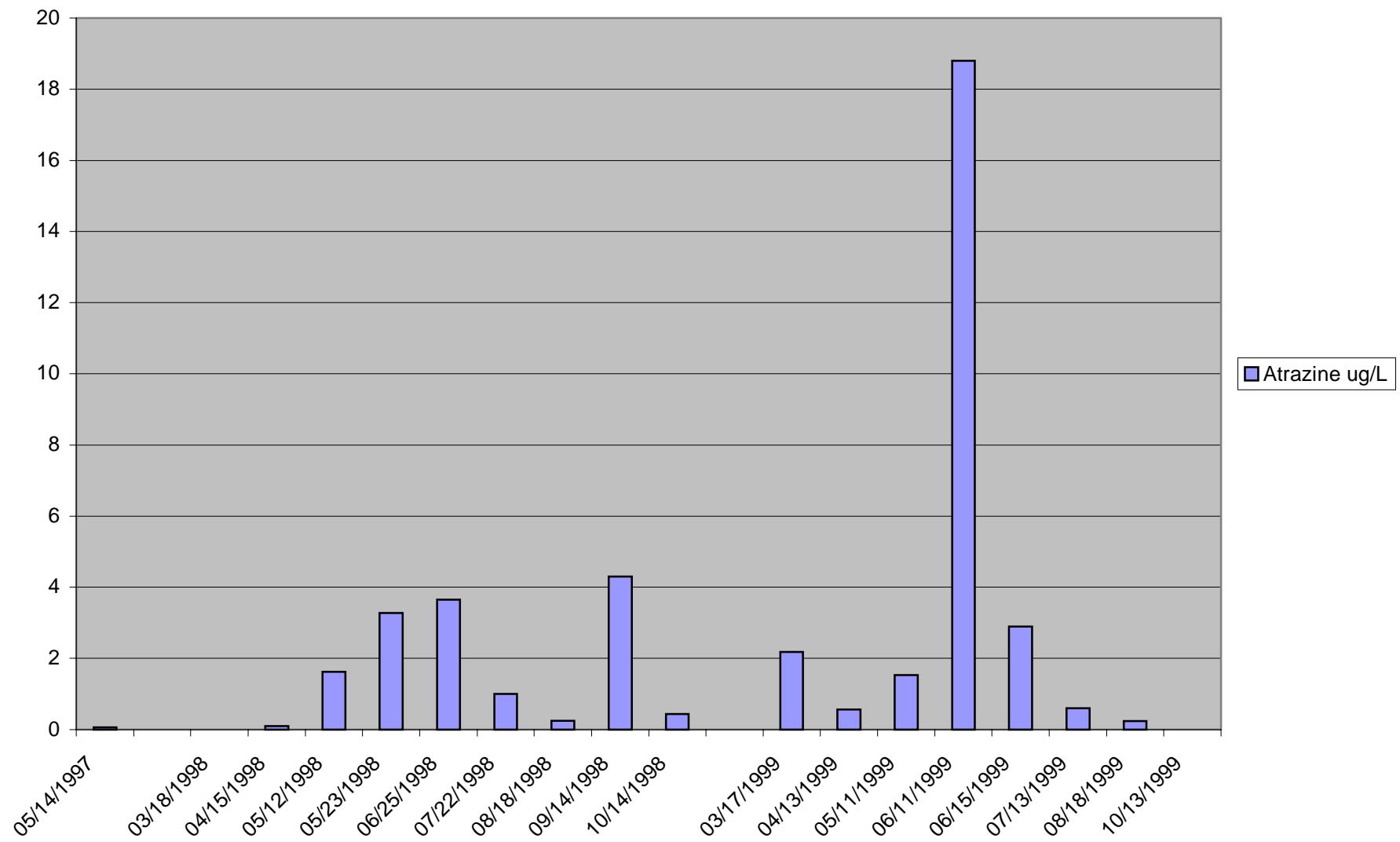
**Figure 3. Chariton River (RA-32) Atrazine Concentrations, 1997-1999**



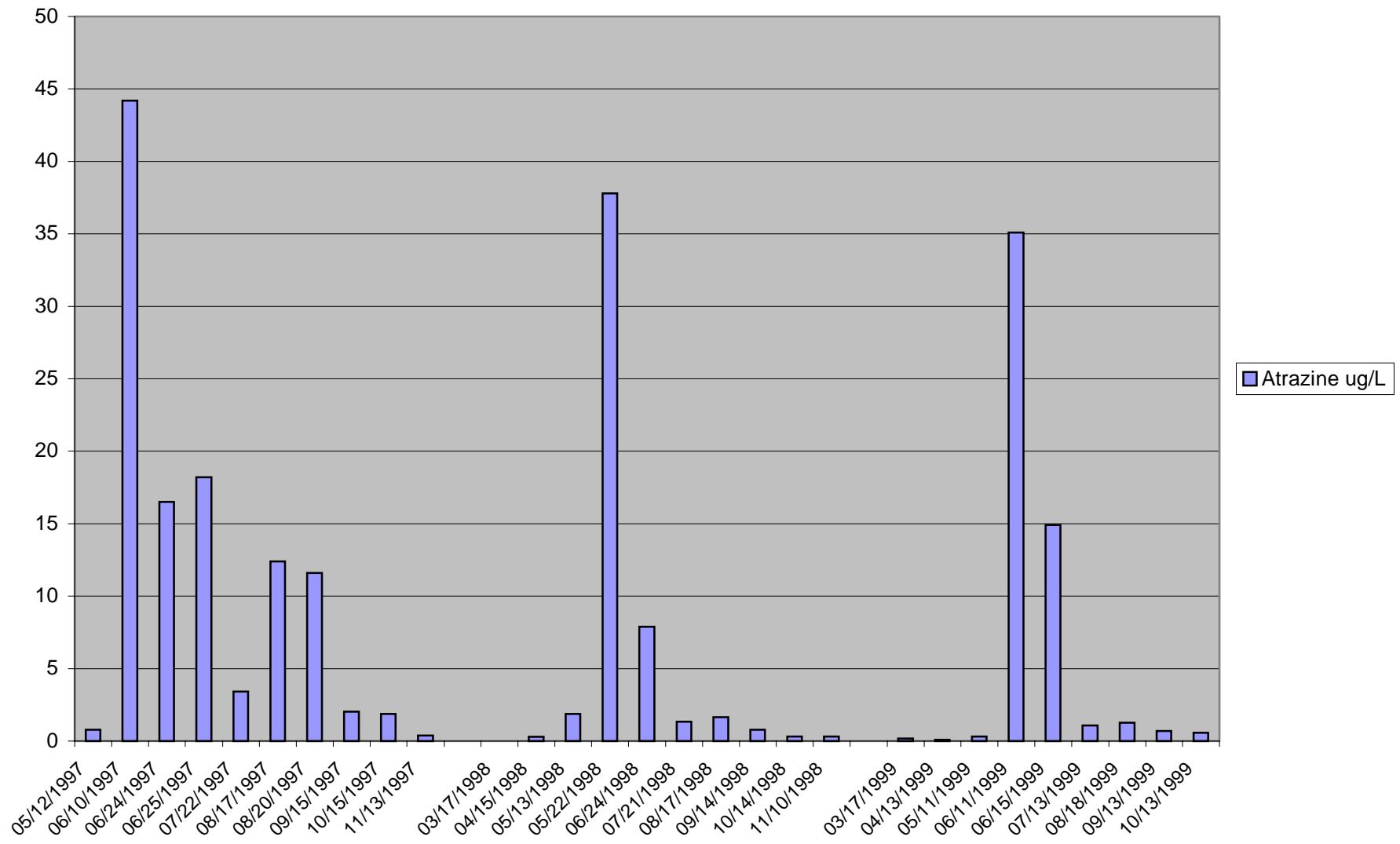
**Figure 4. Chariton Ck (RA-33) Atrazine Concentrations, 1997-1999**



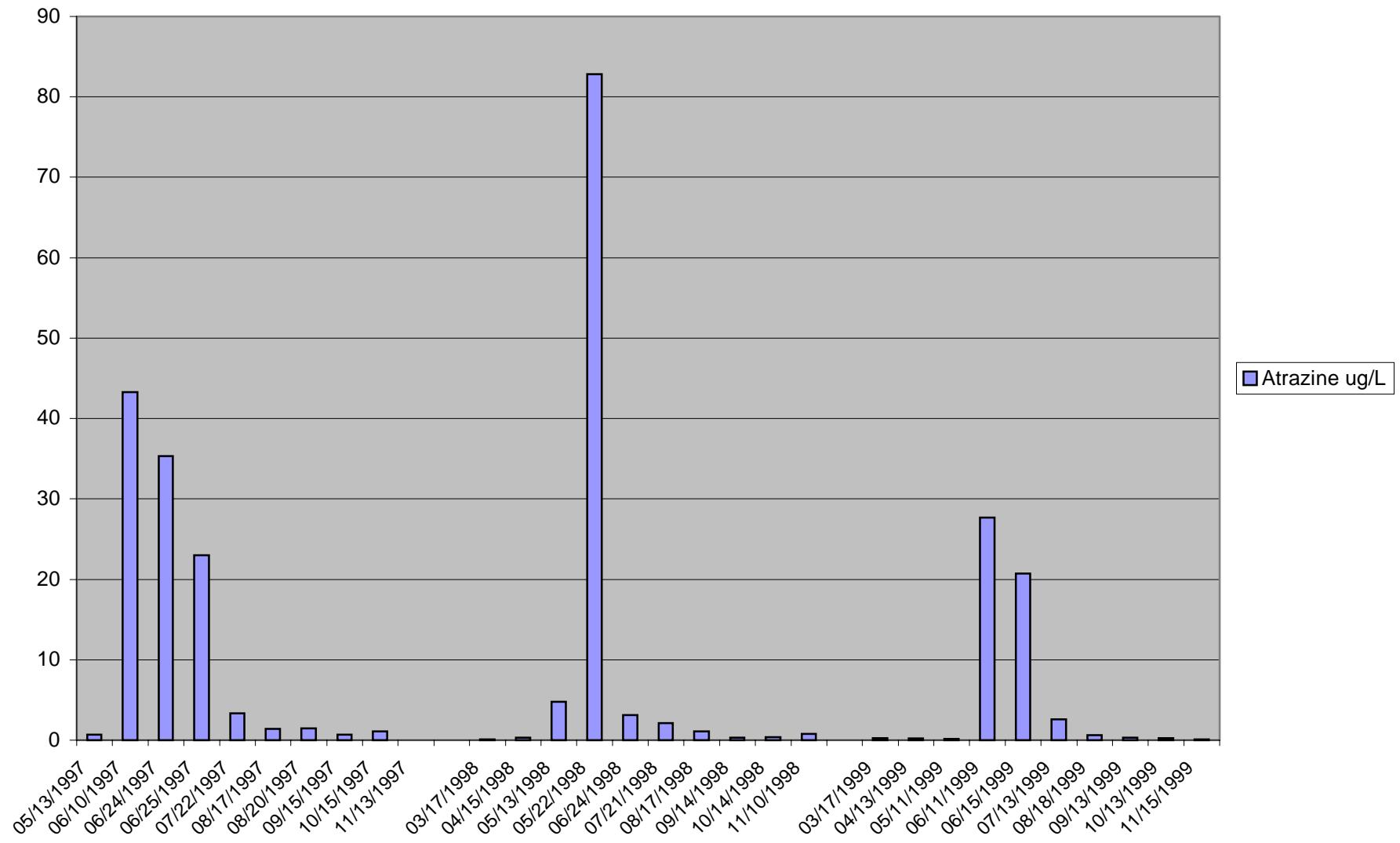
**Figure 5. Unnamed Ck (RA-34) Atrazine Concentrations, 1997-1999**



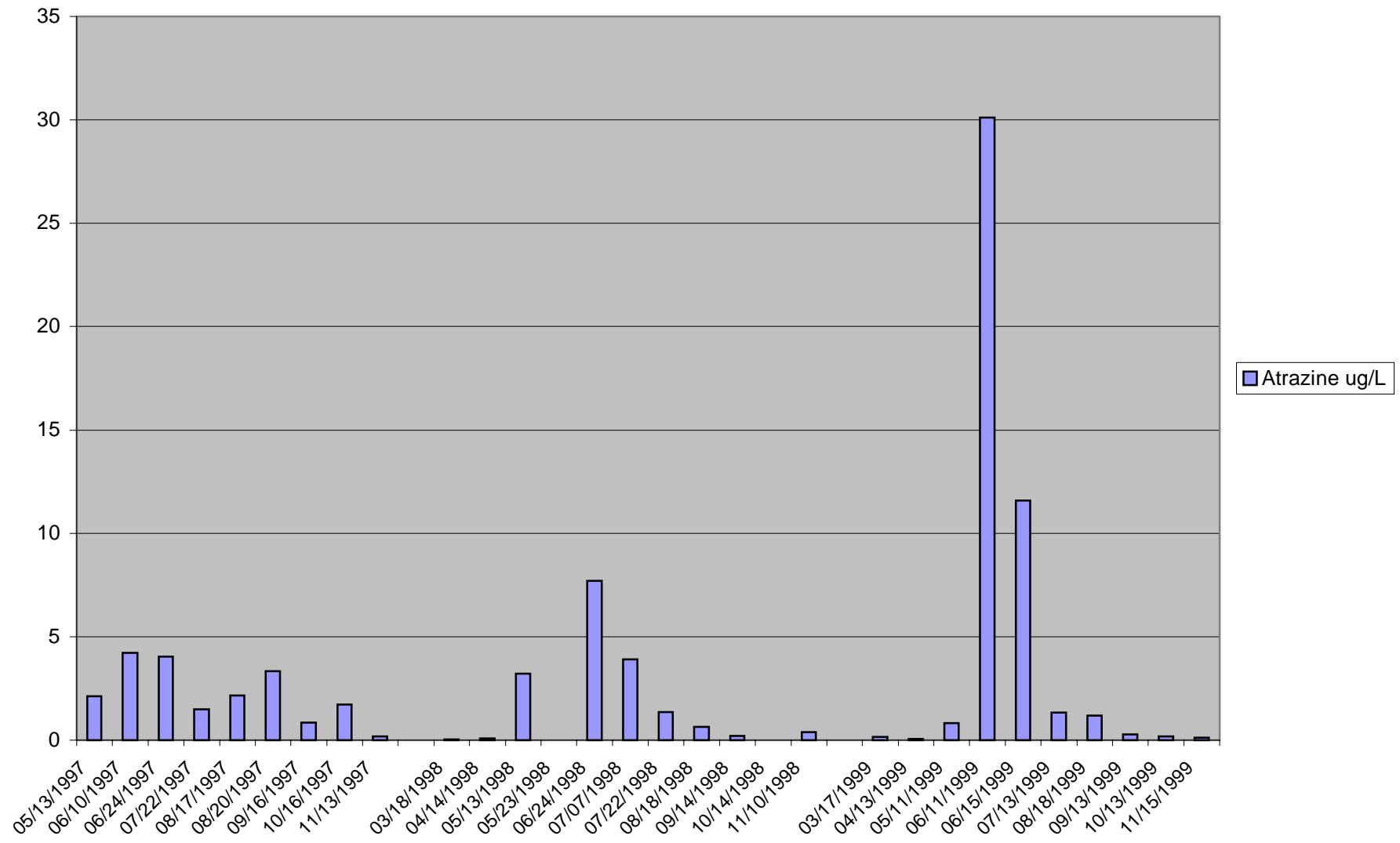
**Figure 6. South Fork Chariton River (RA-35) Atrazine Concentrations, 1997-1999**



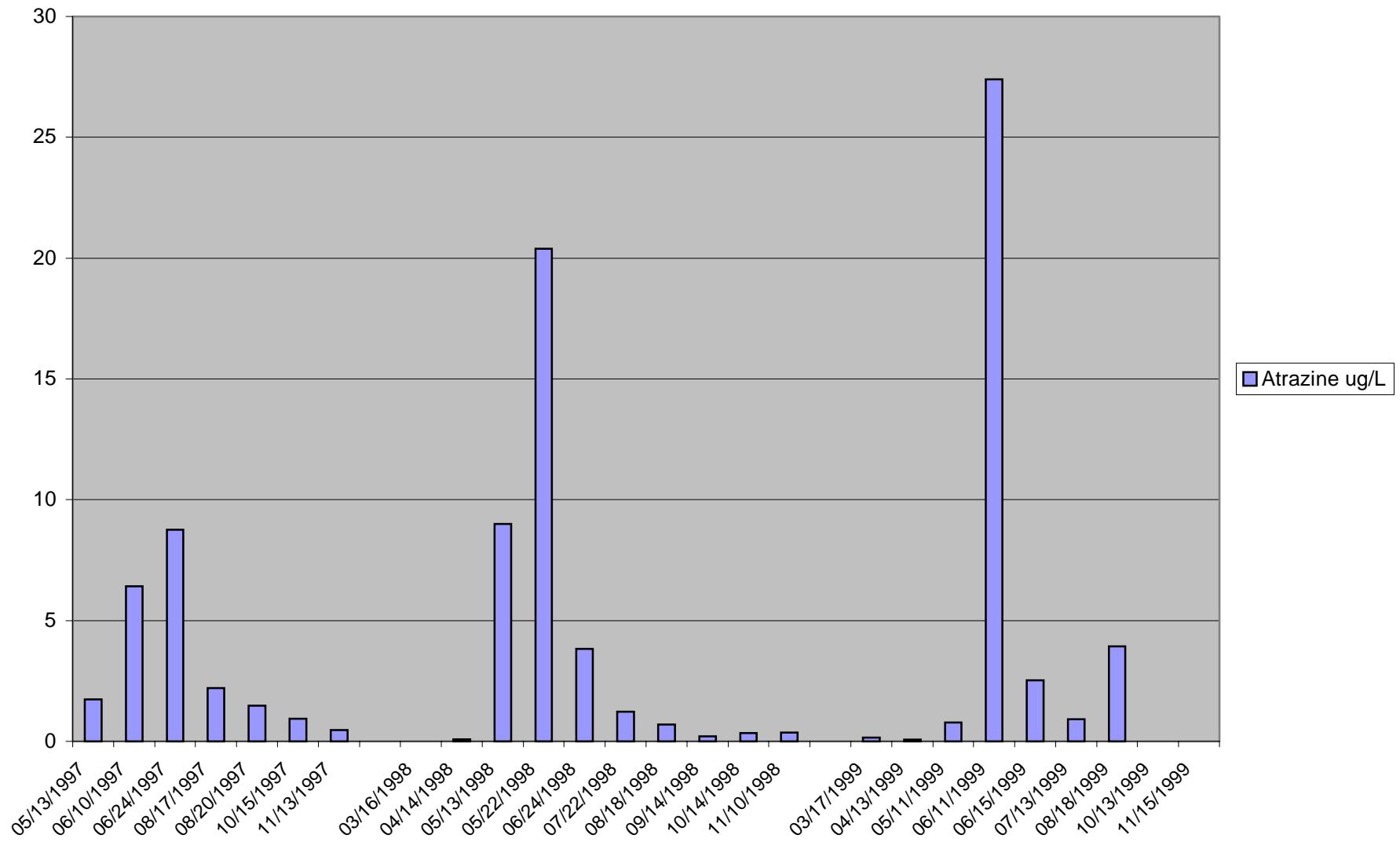
**Figure 7. Nine Mile Ck (RA-36) Atrazine Concentrations, 1997-1999**



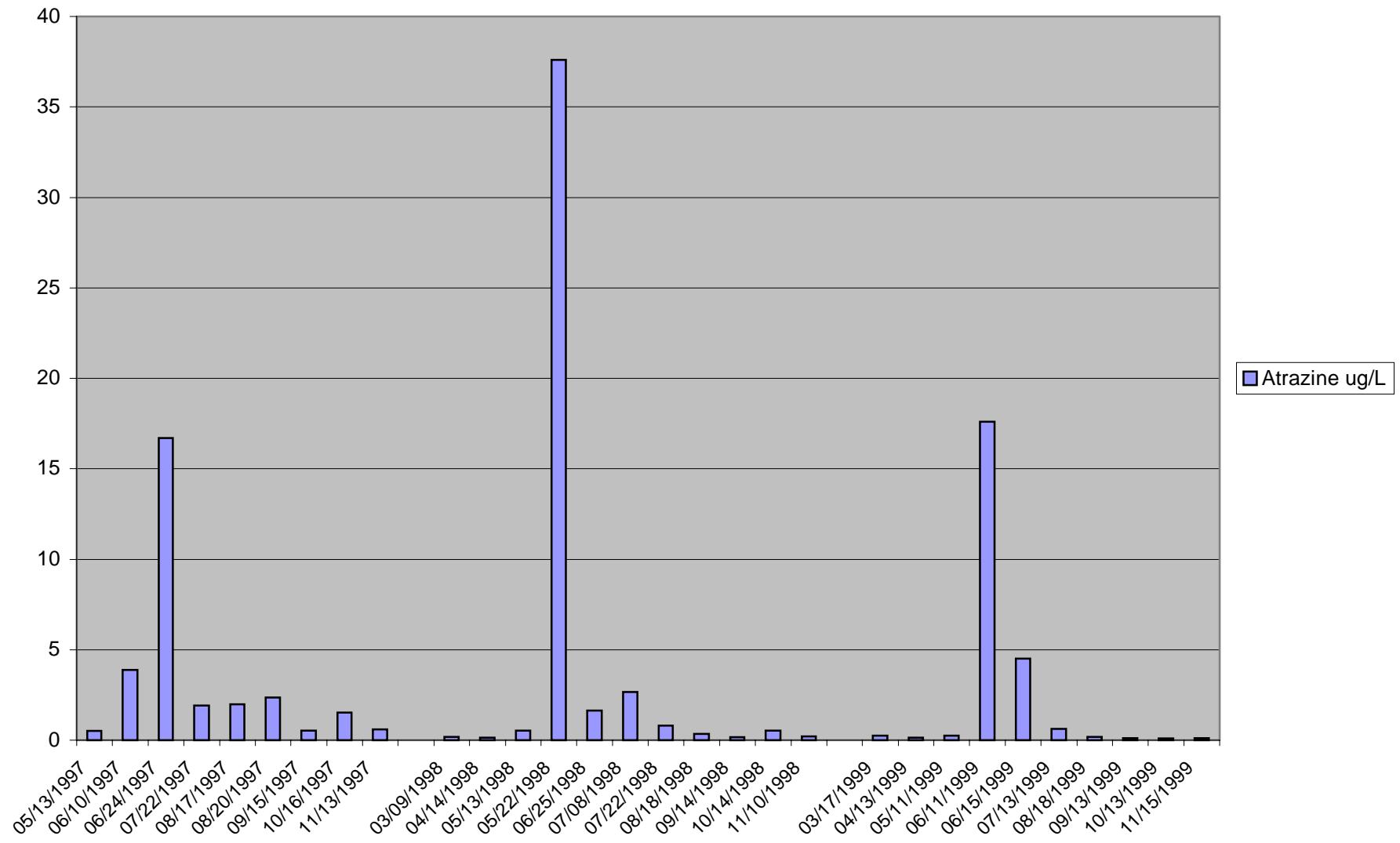
**Figure 8. Jordan Ck ( RA-37) Atrazine Concentrations, 1997-1999**



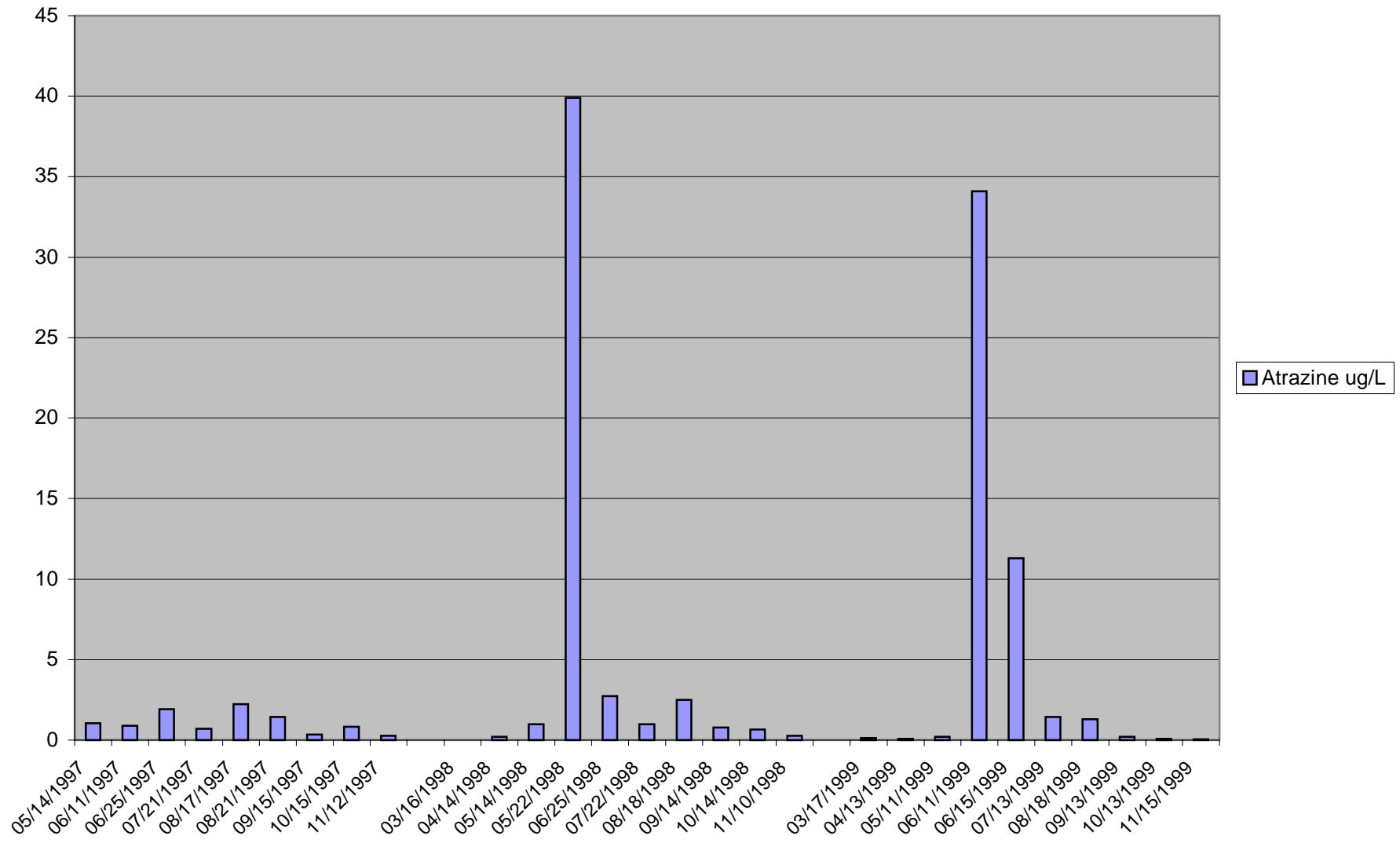
**Figure 9. Walker Br (RA-38) Atrazine Concentrations, 1997-1999**



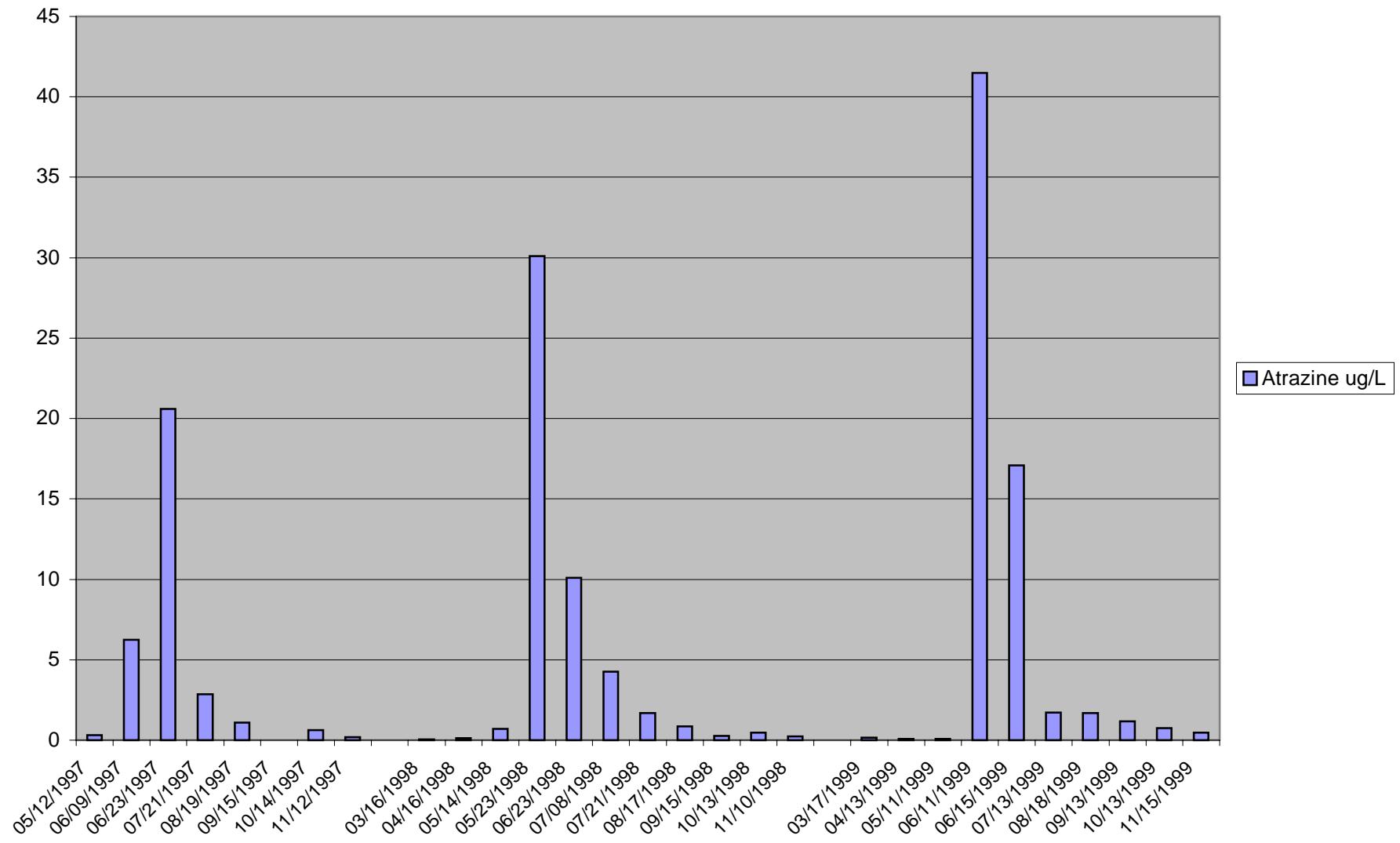
**Figure 10. Jackson Ck (RA-39) Atrazine Concentrations, 1997-1999**



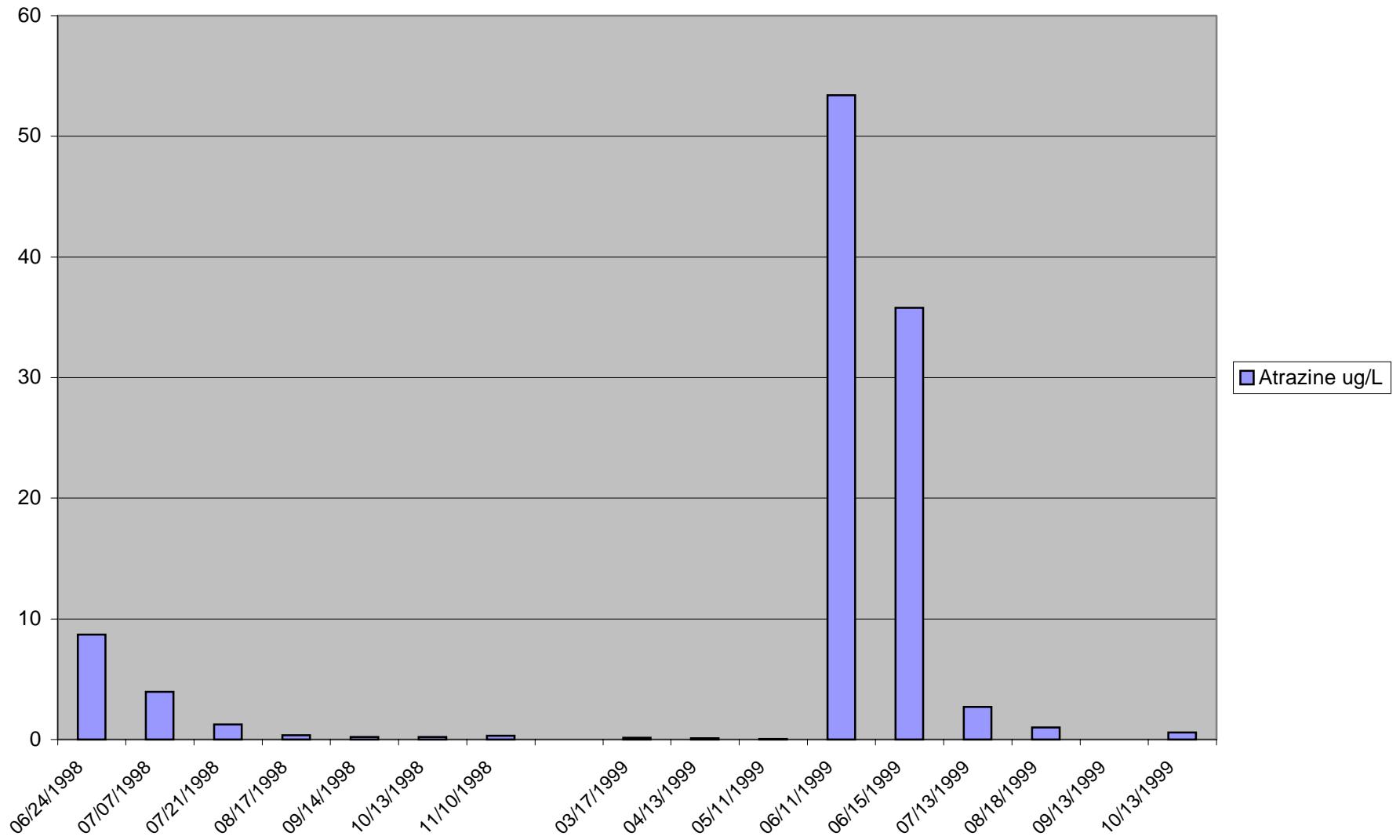
**Figure 11. Honey Ck ( RA-40) Atrazine Concentrations, 1997-1999**



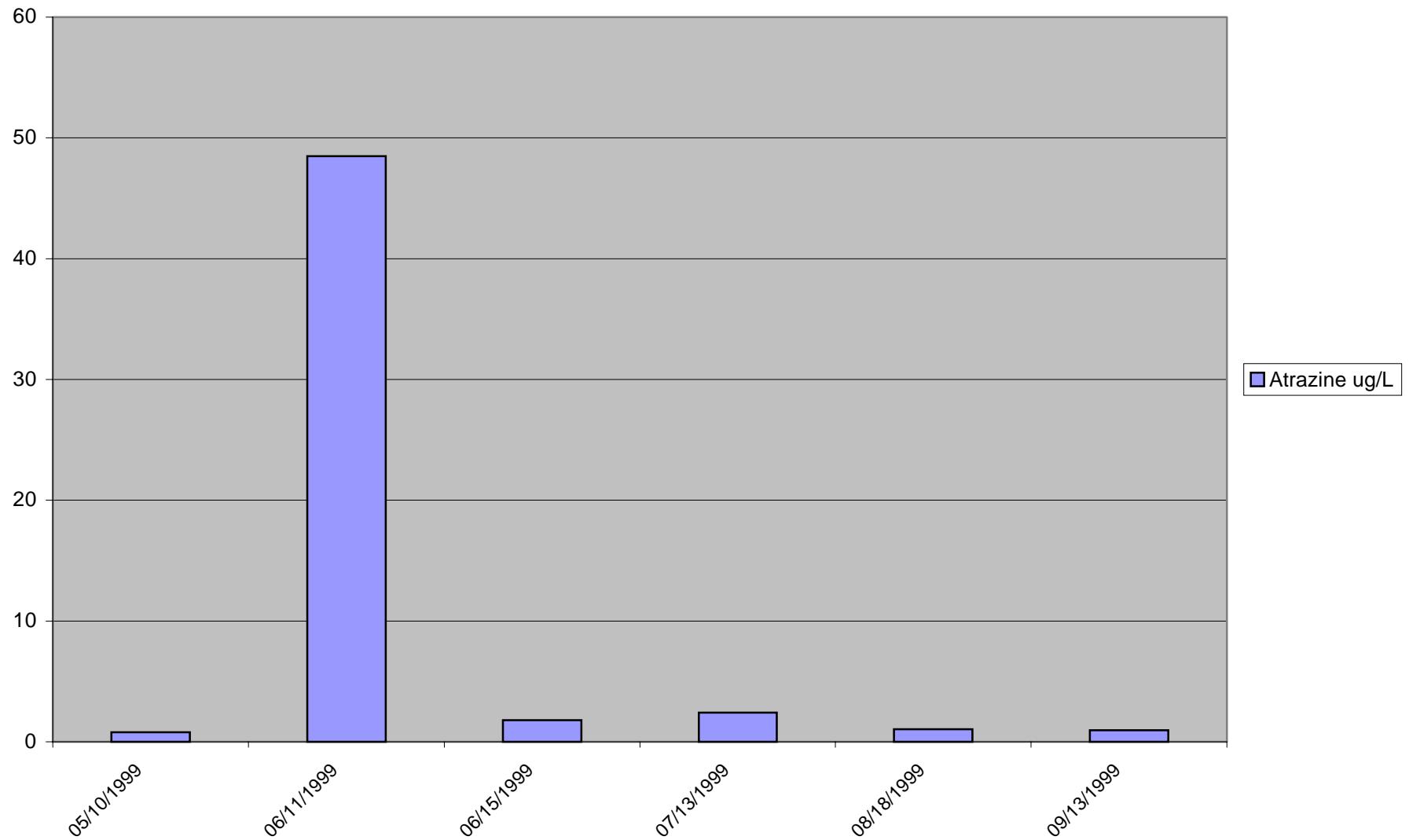
**Figure 12. Wolf Ck ( RA-41) Atrazine Concentrations, 1997-1999**



**Figure 13. Five Mile Ck ( RA-42) Atrazine Concentrations, 1997-1999**



**Figure 14. Honey Ck (RA-43) Atrazine Concentrations, 1999**



b. Lake. The lake exhibited a fairly typical thermal regime during 1999. Ambient profiling revealed the development of thermal stratification in some up-lake areas in May and in the more down-lake areas in June (Appendix, Table 7). Stratification was most intense in July with near anaerobic conditions within the hypolimnion of the more down-lake areas. While there was little change noted in the South Fork arm above the State Hwy 142 Bridge (RA-8) in August, the Chariton arm above the State Hwy 142 Bridge (RA-7) had much improved oxygen concentrations in its bottom waters. Destratification was complete throughout the lake by the September survey. With increased cooling and wind mixing, the lake exhibited even higher DO concentrations at all depths in October.

The eutrophic nature of Rathbun Lake, characterized by high nutrient loading from the spring run-off, was again evident in the 1999 data. Nutrients, turbidity, and suspended solids were highest in April-July in association with storm-run-off storage. And, while gradual clearing occurred over the sampling season, nutrient levels decreased only slightly in the water column (characterized by surface, mid-depth, and bottom sampling). Since algal productivity is restricted to the upper strata of the water column, surface concentrations will be discussed; however, data for all three depths, which were compiled for computer modeling, are presented in the Appendix, Tables 8-9.

In the upper Chariton arm (RA-7), total nitrogen concentrations were eutrophic throughout the seven survey periods. Mean, minimum, and maximum TN concentrations in surface waters were 1.73 mg/L, 0.90 mg/L, and 3.21 mg/L, respectively (Table 3). Total phosphorus concentrations also exceeded the generalized lake eutrophy criterion of 0.05 mg/L for all depths and times except a single surface sample in October. Mean, minimum, and maximum TP concentrations in the surface waters were 0.10 mg/L, 0.04 mg/L, and 0.15 mg/L, respectively.

Similarly, TN concentrations in the upper South Fork arm (RA-8) were eutrophic throughout the sampling season. Mean, minimum, and maximum TN concentrations in the surface waters were 1.55 mg/L, 0.71 mg/L, and 3.02 mg/L, respectively. The TP concentrations in this portion of Rathbun Lake also exceeded the generalized lake eutrophy criterion. Mean, minimum, and maximum TP concentrations in the surface waters were 0.14 mg/L, 0.08 mg/L, and 0.23 mg/L, respectively.

In the down lake area near the dam (RA-3), TN concentrations were slightly lower presumably as a result of sedimentation and algal uptake in the up-lake waters. The TN concentrations, however, still exceeded the eutrophy criterion in every month except October. Mean, minimum, and maximum TN concentrations in the surface waters of RA-3 were 1.25 mg/L, 0.39 mg/L, and 1.85 mg/L, respectively. The TP concentrations exceeded the eutrophy criterion in four of the seven survey periods. Mean, minimum, and maximum TP concentrations were 0.05 mg/L, 0.01 mg/L, and 0.07 mg/L respectively.

Table 3. Rathbun Lake 1999 Statistical Data for Surface Waters

STAT		TN mg/L	TP mg/L	TSS mg/L	TURB NTU	SECCHI m	PHOTIC m	CHLOR ug/L	ATZ ug/L	METO ug/L	CYAN ug/L	ALA ug/L
RA-3 Down Lake	Mean	1.25	0.05	12	17	0.65	1.58	4.7	0.86	1.27	0.1	0.07
	Min.	0.39	0.01	8.1	11	0.46	1.31	4	0.52	0.3	0.06	<0.05
	Max.	1.85	0.07	17	24	0.88	2.04	6.2	1.31	2.12	0.22	0.11
RA-7 Char. Arm	Mean	1.73	0.1	23	37	0.38	1.07	6.4	0.75	1.75	0.07	0.09
	Min.	0.9	0.04	13	15	0.21	0.61	2.6	0.48	0.25	<0.04	<0.05
	Max.	3.21	0.15	53	69	0.61	1.31	12.4	1	3.07	0.18	0.18
RA-8 S. Fork Arm	Mean	1.55	0.14	35	57	0.28	0.69	11.8	0.95	2.12	0.06	0.1
	Min.	0.71	0.08	19	18	0.15	0.3	2	0.11	<0.05	<0.04	<0.05
	Max.	3.02	0.23	50	132	0.46	1.16	21.2	1.91	6.9	0.2	0.25
RA-25 Honey Ck Arm	Mean	1.36	0.04	12	17	0.71	1.77	9.7	0.92	1.25	0.11	0.05
	Min.	0.48	0.03	7	11	0.52	1.25	7.6	0.56	0.27	0.07	<0.05
	Max.	2.04	0.06	16	26	0.91	2.35	15	1.8	1.96	0.2	0.09
RA-28 Outlet	Mean	1.28	0.05	18	24				0.85	1.2	0.09	0.05
	Min.	0.25	0.02	9	12				0.51	0.28	0.06	<0.05
	Max.	2.35	0.07	34	37				1.5	2.09	0.2	0.1

In comparison to 1997-1998 levels, herbicide concentrations in the lake were lower in 1999. And although there were numerous exceedences of the aquatic life criterion for atrazine (1ug/L), there was only one exceedence of a MCL or MCLG for drinking water supplies in 1999 sampling. The cyanazine concentration (1.21 ug/L) in a May bottom sample at RA-8 exceeded the MCLG of 1 ug/L. Concentrations within the water column (characterized by the three sampling depths) were not significantly different. As a result, the following section will be primarily a statistical summary of surface concentrations.

In the upper Chariton arm (RA-7), atrazine concentrations in the bottom waters exceeded the aquatic life criterion in the August, September, and October surveys. In the surface waters, atrazine concentrations fell below 1 ug/L in six of seven surveys. The 1999 mean, minimum, and maximum atrazine concentrations in the surface waters were 0.75 ug/L, 0.48 ug/L, and 1.00 ug/L, respectively. The levels are substantially lower than the 1998 mean and maximum atrazine concentrations of 2.14 ug/L and 12.60 ug/L, respectively (Appendix, Table 10). The mean, minimum, and maximum concentrations for the three other herbicides were cyanazine, 0.07 ug/L, <0.04 ug/L, and 0.18 ug/L; metolachlor, 1.75 ug/L, 0.25 ug/L, and 3.07 ug/L; and alachlor, 0.09 ug/L, <0.05 ug/L, and 0.18 ug/L, respectively.

In the upper South Fork arm (RA-8), atrazine concentrations exceeded the aquatic life criterion from May through October. The mean, minimum, and maximum atrazine concentrations in the surface waters were 0.95 ug/L, 0.11 ug/L, and 1.91 ug/L, respectively. The latter was the highest concentrations detected in the lake in 1999. Substantially higher concentrations were present in 1998 when the mean and maximum concentrations were 3.54 ug/L and 16.70 ug/L, respectively, in this portion of the lake. Mean, minimum, and maximum concentrations for the other herbicides were cyanazine, 0.06 ug/L, <0.04 ug/L, and 0.20 ug/L;

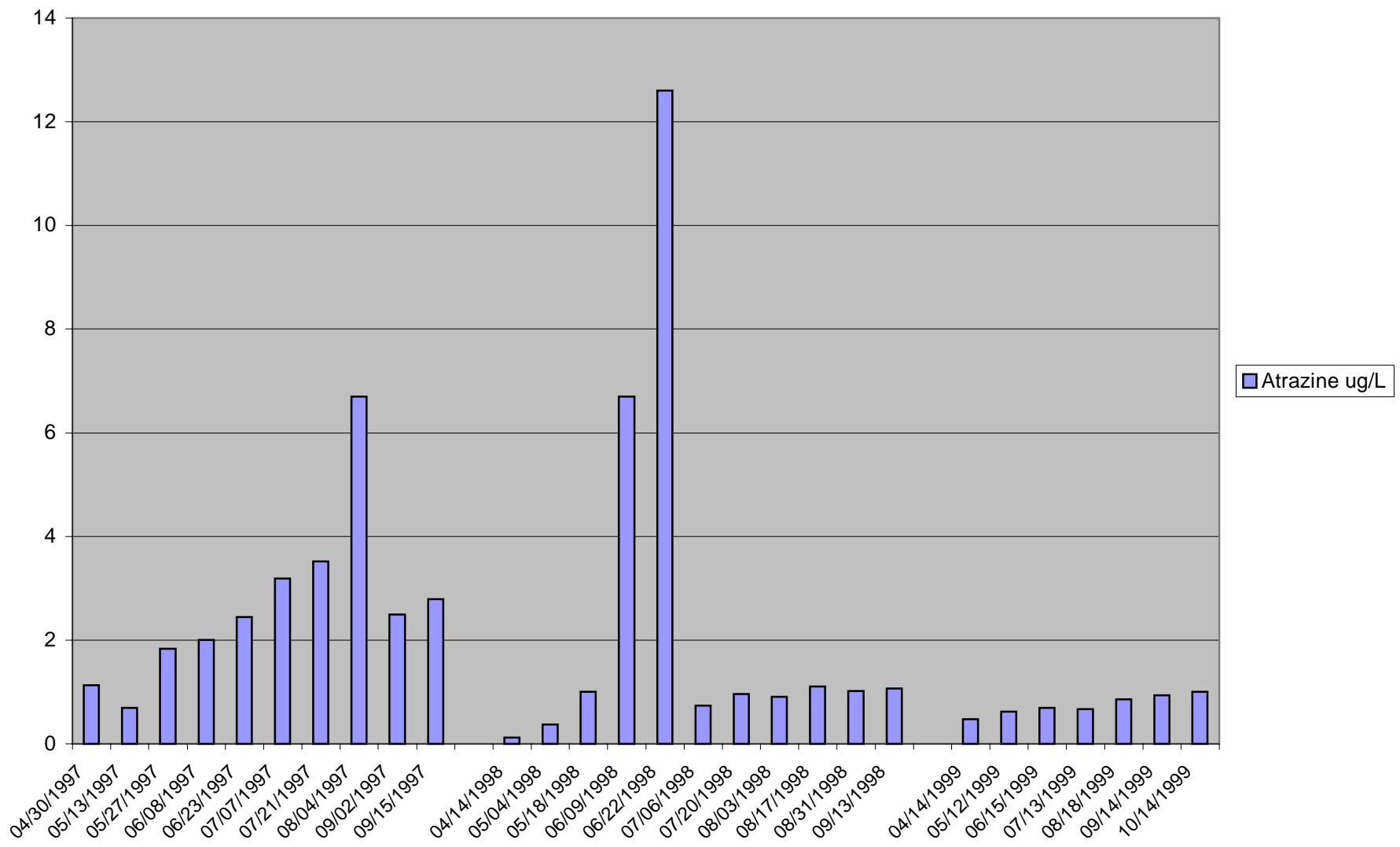
metolachlor, 2.12 ug/L, <0.05 ug/L, and 6.9 ug/L; and alachlor, 0.10 ug/L, <0.05 ug/L, and 0.25 ug/L, respectively.

The Honey Creek arm (RA-25) had only a single exceedence of the aquatic life criterion for atrazine. The 1999 mean, minimum, and maximum concentrations in the surface waters were 0.92 ug/L, 0.56 ug/L, and 1.80 ug/L, respectively. Mean, minimum, and maximum concentrations for the remaining herbicides were cyanazine, 0.11 ug/L, 0.07 ug/L, and 0.20 ug/L; metolachlor, 1.25 ug/L, 0.27 ug/L, and 1.96 ug/L; and alachlor, 0.05 ug/L, <0.05 ug/L, and 0.09 ug/L, respectively.

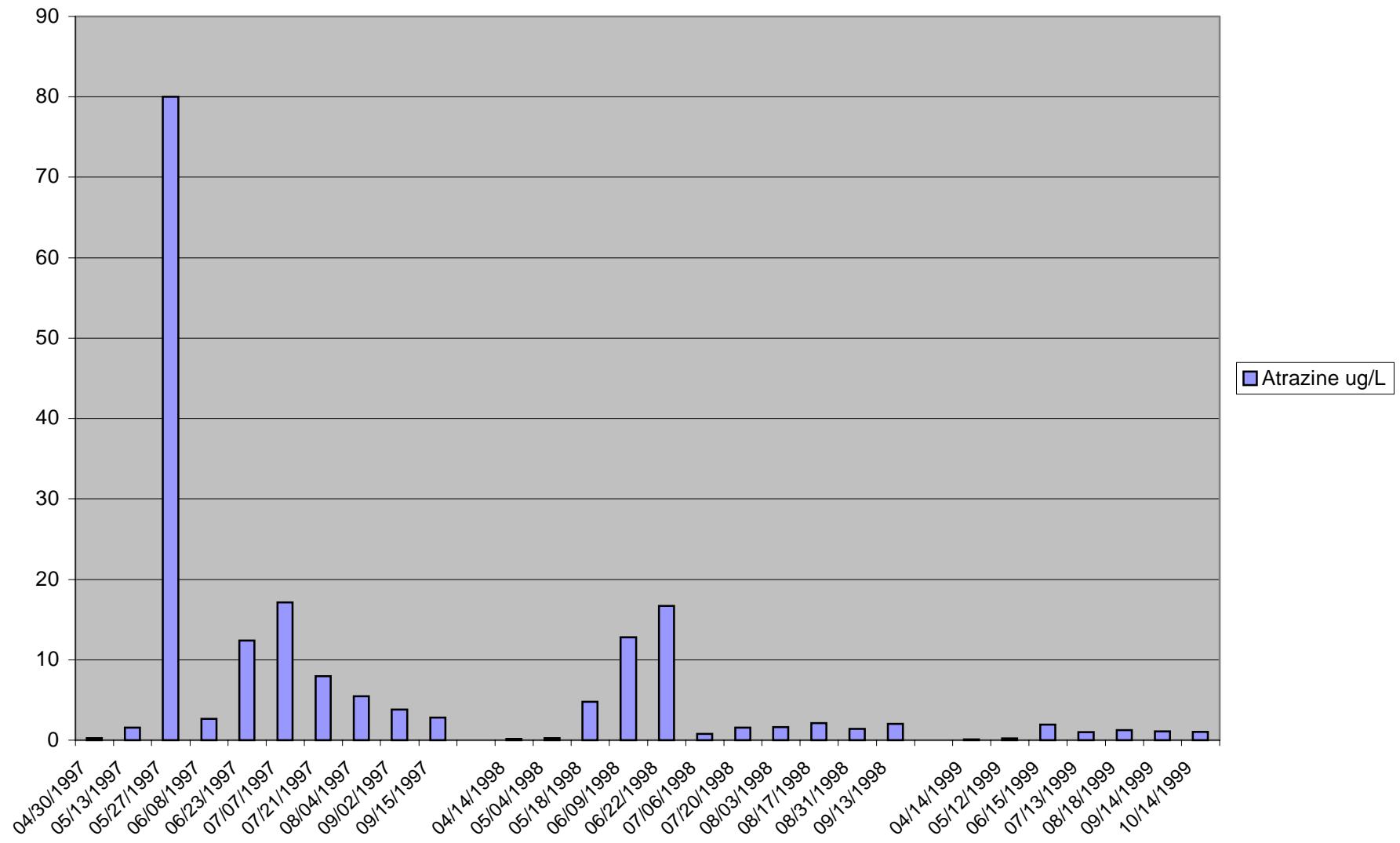
The down lake area (RA-3) also had only a single exceedence of the aquatic life criterion for atrazine. The 1999 mean, minimum, and maximum concentrations were 0.86 ug/L, 0.52 ug/L, and 1.31 ug/L, respectively. The mean, minimum, and maximum concentrations for the other herbicides were cyanazine, 0.10 ug/L, 0.06 ug/L, and 0.22 ug/L; metolachlor, 1.27 ug/L, 0.30 ug/L, and 2.12 ug/L; and alachlor, 0.07 ug/L, <0.05 ug/L, and 0.11 ug/L, respectively.

A comparison of atrazine concentrations in the lake over the last 3 years is presented in Figures 15-17. In general, the 1999 levels appear to be lowest observed in this cooperative study. The high concentrations present in the upper arms of the lake in 1997-1998 were not observed in 1999.

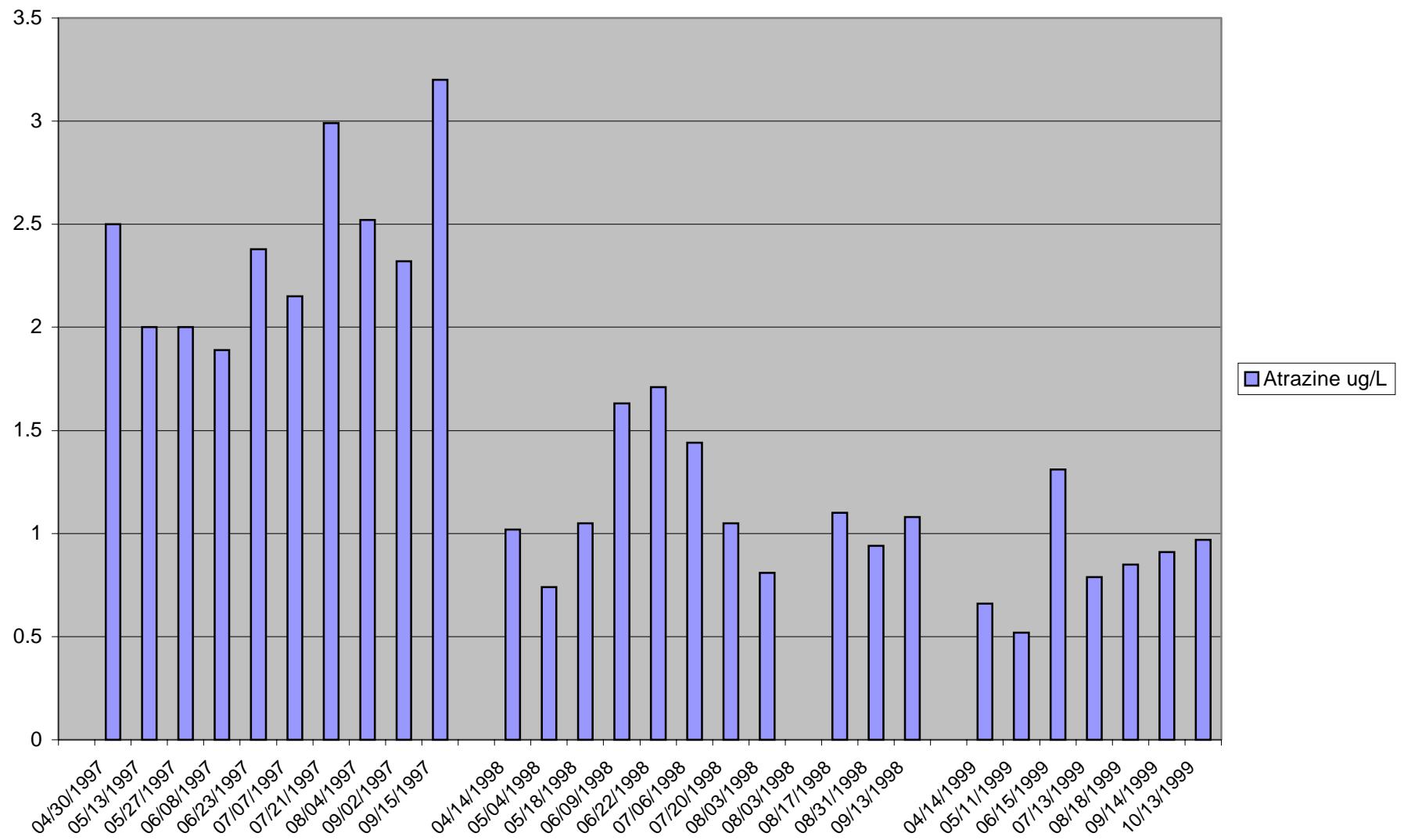
**Figure 15. Chariton Arm (RA-7) Atrazine Concentrations, 1997-1999**



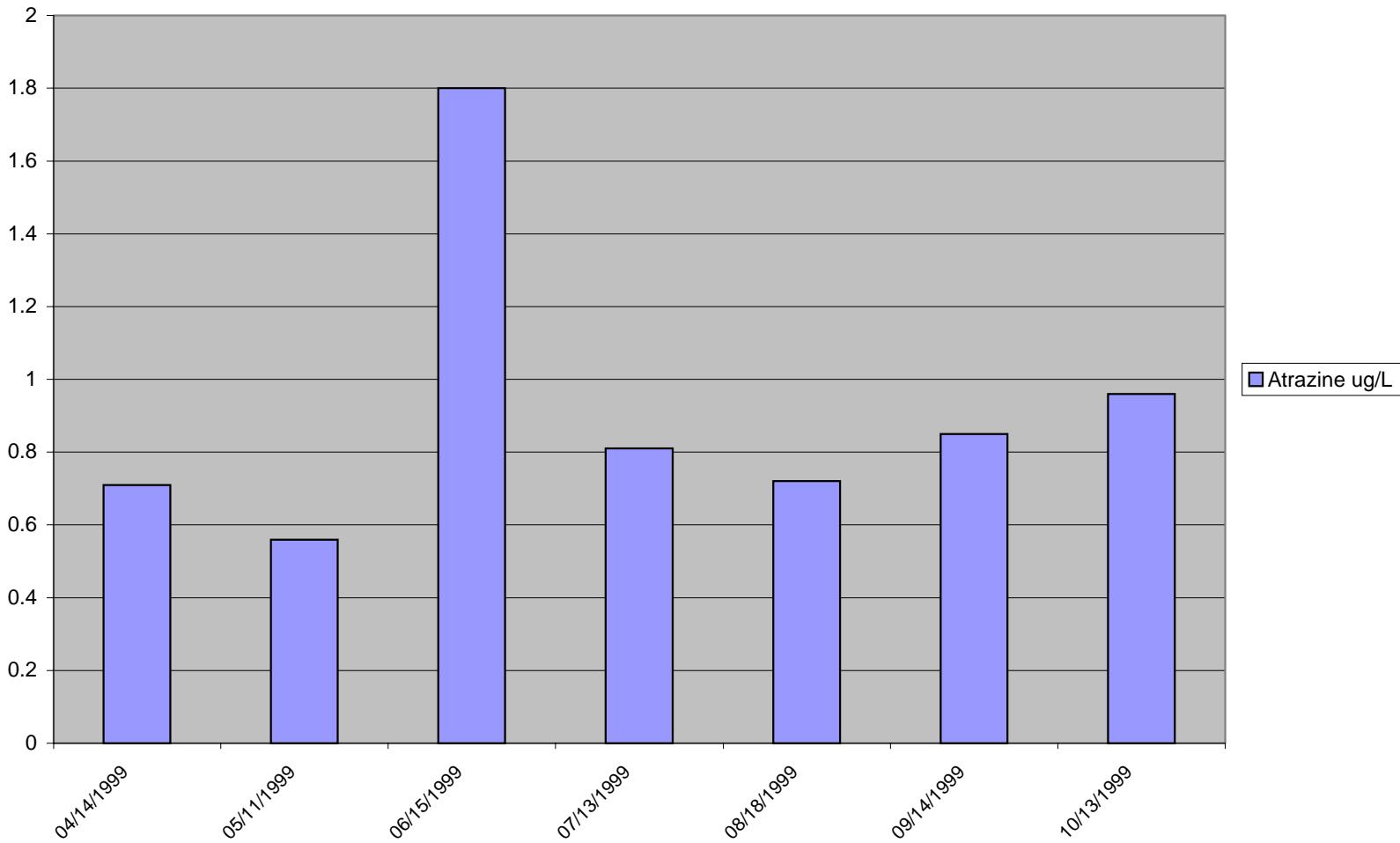
**Figure 16. South Fork Chariton Arm ( RA-8) Atrazine Concentrations, 1997-1999**



**Figure 17. Down Lake (RA-3) Atrazine Concentrations, 1997-1999**



**Figure 18. Honey Ck Arm (RA-25) Atrazine Concentrations, 1999**



Turbidity, total suspended solids (TSS), secchi depth, and photic zone depth during 1999 were indicative of reasonably good water clarity in the surface waters of the impoundment. Historically, turbidity has ranged from highly turbid to moderately turbid in the upper arms of the lake and from turbid to moderately clear in the down lake area. And within the water column, turbidity has been significantly higher in the bottom strata than in the upper strata as a result of sedimentation and the gradual settling of suspended solids. Since the primary interest is on the algal response to surface water clarity, the following section will present only a statistical summary of the upper strata of the lake. However, a complete compilation of each of the above parameters is presented in Appendix Table 8.

In comparison to earlier years, turbidity in the upper Chariton arm (RA-7) was slightly lower during 1999 sampling periods. The mean, minimum, and maximum surface turbidities were 37 NTU, 15 NTU, and 69 NTU, respectively. Corresponding TSS concentrations ranged from 13-53 mg/L with a mean of 23 mg/L. Secchi depths in the arm ranged from 0.21-0.61 m (mean, 0.38 m). The photic zone depth, which is the maximum depth utilized by algal populations, ranged from 0.61-1.31 m (mean, 1.07).

The South Fork arm (RA-8) exhibited turbidities more typical of the upper portions of Rathbun Lake with mean, minimum, and maximum of 57 NTU, 18 NTU, and 132 NTU, respectively, in 1999. The corresponding TSS concentrations ranged from 19-50 mg/L with a mean of 35 mg/L. Secchi depths ranged from 0.15-0.46 m (mean, 0.28 m). The photic zone depth ranged from 0.3-1.16 m (mean, 0.69 m).

The Honey Creek arm (RA-25) with its smaller watershed did not exhibit the higher turbidities common to the upper arms. The 1999 mean, minimum, and maximum turbidities in the surface waters were 17 NTU, 11 NTU, and 26 NTU, respectively. Corresponding TSS ranged from 7-16 mg/L with a mean of 12 mg/L. The higher water clarity resulted in secchi depths ranging from 0.52-0.91 m (mean, 0.71 m). The photic zone depths were substantially higher ranging from 1.25-2.35 m (mean, 1.77 m).

The down lake area (RA-3) exhibited moderately clear conditions during 1999. The mean, minimum, and maximum surface turbidities were 17 NTU, 11 NTU, and 24 NTU, respectively. Corresponding TSS ranged from 8.1-17 mg/L with a mean of 12 mg/L. The secchi depths ranged from 0.46-0.88 m (mean, 0.65 m). The photic zone depths ranged from 1.31-2.04 m (mean, 1.58 m).

The algal response to the available nutrient and water clarity conditions was within an expected range based on historical data. The higher turbidities and TSS along with the lower transparencies (reflected by the secchi and photic depths) during April-June indicated that light limitation was a major factor in the small algal standing crop or biomass in the upper Chariton arm in the early part of the year. Chlorophyll concentrations, which are commonly used as an algal biomass indicator, were in the 2-3 ug/L range in this period, but increased substantially (>12 ug/L) later in the year as water clarity improved. The 1999 mean, minimum, and maximum chlorophyll a concentrations were 6.4 ug/L, 2.6 ug/L, and 12.4 ug/L, respectively. The former is well below the generalized eutrophy criterion for lakes (a mean growing season concentration of

10 ug/L).

The South Fork arm (RA-8) also exhibited low chlorophyll concentrations early in the sampling year in response to the high turbidities and low water clarity. Improved conditions during August-October led to significantly higher concentrations (15-21 ug/L). The 1999 mean, minimum, and maximum chlorophyll a concentrations were 11.8 ug/L, 2.0 ug/L, and 21.2 ug/L, respectively. Although the former is above the eutrophy criterion, it is not in a range, which would be considered excessive or indicative of hypereutrophication.

With reasonably good water clarity, the Honey Creek arm (RA-25) exhibited uniformly good chlorophyll concentrations (8-9.7 ug/L) throughout the early part of the sampling year. With continued good water clarity, chlorophyll concentrations peaked in October. The 1999 mean, minimum, and maximum chlorophyll a concentrations were 9.7 ug/L, 7.6 ug/L, and 15.0 ug/L, respectively.

Chlorophyll concentrations were fairly low in the down lake area (RA-3) throughout the year despite the area's similar water quality to that of Honey Creek arm. The mean, minimum, and maximum chlorophyll a concentrations were 4.7 ug/L, 4.0 ug/L, and 6.2 ug/L, respectively. The condition is not unique since lower concentrations have frequently been noted in the down lake areas of other District lakes. Upper arms and secondary arms with clearing conditions typically have higher algal standing crops.

To confirm bacterial sampling results by an outside contractor, PM-PR-W performed additional fecal coliform analyses at selected beaches and marinas during the primary recreation season (June-August). Fecal coliform bacteria densities were not found to exceed the primary contact standard of 200 colonies/100 mL during the three sampling dates. On 14 June the three sampling stations, the Buck Creek Recreation Area beach just outside the mouth of arm (RA-31), the Buck Creek Marina (RA-18), and the Island View Beach, had fecal coliform densities of 80, 11, and 18 colonies/100 mL, respectively. On 12 July the four sampling stations had the following fecal coliform densities: Buck Creek Beach, 0 colonies/100 mL; the Buck Creek Marina, 45 colonies/100 mL; Island View Beach, 80 colonies/100 mL; and the South Fork Marina, 20 colonies/100 mL. On 18 August the five sampling stations had the following densities: Buck Creek Beach, 18 colonies/100 mL; Buck Creek Marina, 10 colonies/100 mL; Island View Beach, 19 colonies/100 mL; South Fork Marina, 16 colonies/100 mL; and the Buck Creek beach inside the arm (RA-16), 14 colonies/100 mL.

c. Outflow. As noted over the entire period of record, turbidity and suspended solids were substantially lower in the outlet area (RA-28) than in the inflows as a result of sedimentation in the lake. Mean, minimum, and maximum turbidity in 1999 were 24 NTU, 12 NTU, and 37 NTU, respectively (Table 3). The associated suspended solids were similarly affected with mean, minimum, and maximum concentrations of 18 mg/L, 9 mg/L, and 34 mg/L, respectively.

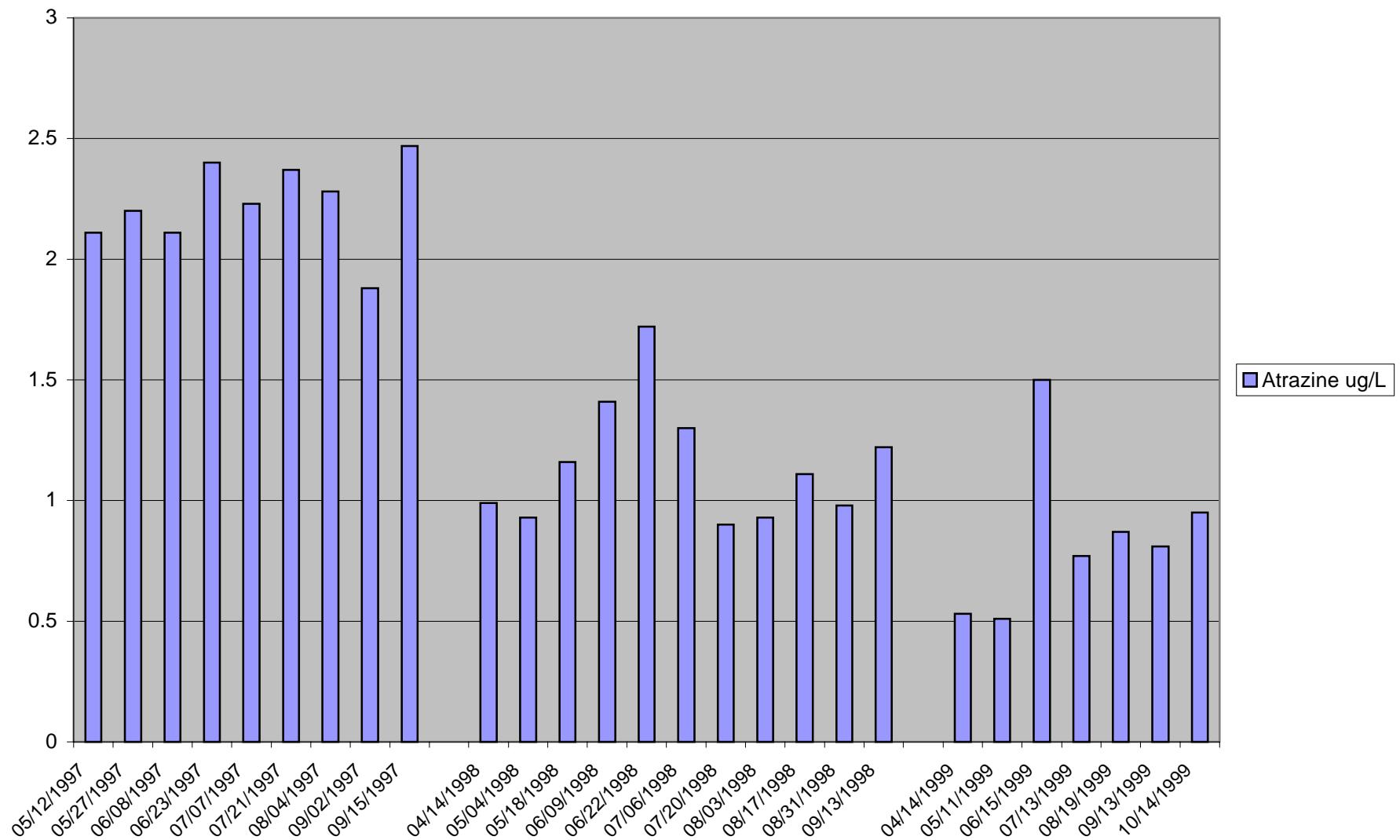
Nutrient levels in the outlet were reduced also as a result of sedimentation or algal uptake upstream. The TN mean, minimum, and maximum concentrations were 1.28 mg/L, 0.25 mg/L, and 2.35 mg/L, respectively. The TP concentrations never exceeded the stream eutrophy

criterion of 0.1 mg/L. Mean, minimum, and maximum TP concentrations were 0.05 mg/L, 0.02 mg/L, and 0.07 mg/L, respectively.

The four commonly detected herbicides were present in low concentrations during 1999. No MCLs or MCLGs were exceeded, but atrazine levels in June slightly exceeded the aquatic life criterion. Atrazine mean, minimum, and maximum concentrations were 0.85 ug/L, 0.51 ug/L, and 1.50 ug/L, respectively. Mean, minimum, and maximum concentrations for the remaining herbicides were metolachlor, 1.20 ug/L, 0.28 ug/L, and 2.09 ug/L; cyanazine, 0.09 ug/L, 0.06 ug/L, and 0.20 ug/L; and alachlor, 0.05 ug/L, <0.05 ug/L, and 0.10 ug/L, respectively.

The 1999 atrazine concentrations were slightly lower than those observed in the two previous years (Figure 19). The 1998 levels were at or above 1 ug/L (mean, 1.15 ug/L), while 1997 data were at or above 2 ug/L (mean, 2.00 ug/L).

**Figure 19. Outlet (RA-28) Atrazine Concentrations, 1997-1999**



#### **4. Future conditions.**

The general water quality of Rathbun Lake is moderately good. The main problems in the dimictic reservoir are turbidity, significant suspended solids loading, high nutrient loading, high iron and manganese concentrations, hypolimnetic oxygen depletion during the summer, and pesticide loading during the spring and early summer. Monitoring over the entire period of record has shown that the pesticide levels pose a continuing threat to the drinking water supplies for the project and to the rural water districts without activated carbon filtration. The latter treatment significantly reduces these pollutants in the finished drinking water, but increases water treatment costs. If land use practices within the watershed do not change, i.e., agricultural practices do not include reductions in soil erosion and in herbicide and fertilizer run-off, the reservoir could potentially reach a point at which it is unable to assimilate the increased loading of silt, nutrients, and pesticides. Water supply, recreation, and sport fishery benefits would then be severely impaired or lost.

#### **5. Recommendations.**

The District should continue to strongly support the cooperative water quality monitoring and pollution abatement program for Rathbun Lake and its watershed. Because of the continuing concerns for suspended solids, nutrient, and pesticide loading and the potential for nonpoint pollution reduction through the cooperative effort, the PM-PR-W recommends the joint sampling program continue during March-November 2000.

Appendix Table 1. 1999 Ambient Stream Data

Station	Date mm/dd/yy	Depth m	Time hhmm	Temp °C	D.O. mg/L	Spec. Cond. u ohms	pH	Orp. mV
RA-12	03/17/1999	0.1	1245			243	7.3	
	04/13/1999	0.1	1240	13.4	8.9	386	7.7	
	05/10/1999	0.1	1400	19.8	9	451	7.6	325
	06/11/1999	0.1	1145	21.6	5.6	178	6.6	
	06/15/1999	0.1	1145	18.6	8.1	344	7.6	
	07/13/1999	0.1	1330	22.9	9.7	417	7.6	
	08/18/1999	0.1	1300	24.7	7.2	408	7.4	
	09/13/1999	0.1	1240	17.5	6.8	458	7.5	
	10/13/1999	0.1	1315	15.1	5.7	569	7.4	
	11/15/1999	0.1	1335	7.5	8.2	558	7.4	
RA-15	03/17/1999	0.1	0745			240	7.2	
	04/13/1999	0.1	0800	11.8	8.3	333	7.2	
	05/10/1999	0.1	1430	17.7	10.2	410	7.6	324
	06/11/1999	0.1	0735	22.1	4.7	182	6.7	
	06/15/1999	0.1	0800	19.3	6.9	207	7.2	
	07/13/1999	0.1	0840	21.4	6.5	223	6.6	
	08/18/1999	0.1	0830	23.1	4.6	265	7	
	09/13/1999	0.1	0810	14.9	5.6	365	7.3	
	10/13/1999	0.1	0830	14.1	6.8	548	7.4	
	11/15/1999	0.1	0835	7.1	11.5	643	7.2	
RA-32	03/17/1999	0.1	1000			227	6.8	
	04/13/1999	0.1	0940	13	8.9	388	7.5	
	05/11/1999	0.1	0940	18.9	6.9	414	7.6	
	06/11/1999	0.1	0915	21.8	4.9	177	6.8	
	06/15/1999	0.1	0930	19.7	6.5	302	7.1	
	07/13/1999	0.1	1032	20.5	5	310	6.9	
	08/18/1999	0.1	1000	22.4	4.5	291	6.9	
	09/13/1999	0.1	0940	14	6.7	480	7.7	
	10/13/1999	0.1	1025	12.1	3.3	470	7.2	
	11/15/1999	0.1	1040	6.2	4.9	579	7.4	
RA-33	03/17/1999	0.1	1020			232	6.9	
	04/13/1999	0.1	1010	11.9	9.3	359	7.5	
	05/11/1999	0.1	1000	18.2	10.3	393	7.9	
	06/11/1999	0.1	0930	21.3	5.7	158	6.9	
	06/15/1999	0.1	0945	16.4	7.9	374	7.2	
	07/13/1999	0.1	1050	19.8	7.6	160	7.1	
	08/18/1999	0.1	1030	22.6	6.4	315	7.2	
	09/13/1999	0.1	1000	13.7	7.6	440	7.7	
	10/13/1999	0.1	1040	11.7	4.6	617	7.3	
	11/15/1999	0.1	1100	5.7	8.2	586	7.5	

Station	Date	Depth	Time	Temp	D.O.	Spec. Cond.	pH	Orp.
	mm/dd/yy	m	hhmm	°C	mg/L	u ohms		mV
RA-34	03/17/1999	0.1	1345			317	7.6	
RA-34	04/13/1999	0.1	1345	13.4	10.9	364	8.3	
RA-34	05/11/1999	0.1	1400	21.3	7.6	313	8.1	
RA-34	06/11/1999	0.1	1235	22.3	5.1	282	7.5	
RA-34	06/15/1999	0.1	1230	15.4	7.5	490	7.5	
RA-34	07/13/1999	0.1	1600	20.8	6.5	271	7.7	
RA-34	08/18/1999	0.1	1400	21.3	6	575	7.1	
RA-35	03/17/1999	0.1	1120			274	7.2	
RA-35	04/13/1999	0.1	1110	12.1	10.6	371	7.8	
RA-35	05/11/1999	0.1	1105	19.1	8.4	398	7.7	
RA-35	06/11/1999	0.1	1020	21.4	5.9	242	7	
RA-35	06/15/1999	0.1	1030	17.7	7.9	289	7.4	
RA-35	07/13/1999	0.1	1153	20.8	8	339	7.6	
RA-35	08/18/1999	0.1	1130	23.4	6.4	267	7.4	
RA-35	09/13/1999	0.1	1100	16	5.8	310	7.7	
RA-35	10/13/1999	0.1	1150	14.7	5.4	372	7.4	
RA-36	03/17/1999	0.1	1100			274	7.2	
RA-36	04/13/1999	0.1	1040	11.3	9.9	351	7.7	
RA-36	05/11/1999	0.1	1045	19.3	8.8	413	7.8	
RA-36	06/11/1999	0.1	1005	20.8	6.2	182	6.9	
RA-36	06/15/1999	0.1	1015	17.4	9.2	120	7.7	
RA-36	07/13/1999	0.1	1134	22.5	9.3	356	7.6	
RA-36	08/18/1999	0.1	1100	24.3	6.8	16	6.7	
RA-36	09/13/1999	0.1	1040	17.6	7.5	434	7.7	
RA-36	10/13/1999	0.1	1125	13.8	6.4	517	7.6	
RA-36	11/15/1999	0.1	1140	12.2	11.8	621	7.7	
RA-37	03/17/1999	0.1	1230			258	7.2	
RA-37	04/13/1999	0.1	1220	12.9	11.4	409	8	
RA-37	05/11/1999	0.1	1235	19.9	8.1	360	7.7	
RA-37	06/11/1999	0.1	1125	21.2	6.3	200	6.9	
RA-37	06/15/1999	0.1	1130	18	8.4	410	7	
RA-37	07/13/1999	0.1	1310	26.6	9.9	420	7.7	
RA-37	08/18/1999	0.1	1230	28.2	8.6	391	7.7	
RA-37	09/13/1999	0.1	1210	16.7	7.8	564	7.3	
RA-37	10/13/1999	0.1	1300	14.1	10.3	639	7.3	
RA-37	11/15/1999	0.1	1310	8.6	14.5	647	7.4	
RA-38	03/17/1999	0.1	1300			315	7.1	
RA-38	04/13/1999	0.1	1305	12.8	10.5	501	7.9	
RA-38	05/11/1999	0.1	1330	19	7.8	506	7.4	
RA-38	06/11/1999	0.1	1200	21.2	6	237	7.1	
RA-38	06/15/1999	0.1	1215	16.6	7.9	473	7.2	
RA-38	07/13/1999	0.1	1355	25	8.2	454	7.7	
RA-38	08/18/1999	0.1	1330	28.7	9	342	8.5	

Station	Date mm/dd/yy	Depth m	Time hhmm	Temp °C	D.O. mg/L	Spec. Cond. u ohms	pH	Orp. mV
RA-39	03/17/1999	0.1	1200			285	7.2	
RA-39	04/13/1999	0.1	1155	12.6	10.2	380	7.8	
RA-39	05/11/1999	0.1	1200	19.3	8.5	412	8	
RA-39	06/11/1999	0.1	1100	21.6	6.2	255	7.1	
RA-39	06/15/1999	0.1	1100	17.6	8.5	369	7.6	
RA-39	07/13/1999	0.1	1241	21.9	8.6	133	8.6	
RA-39	08/18/1999	0.1	1200	23.3	6.8	402	7.5	
RA-39	09/13/1999	0.1	1145	14.7	6.7	547	7.8	
RA-39	10/13/1999	0.1	1230	13.7	2.9	580	7.2	
RA-39	11/15/1999	0.1	1240	8	6.2	720	7.4	
RA-40	03/17/1999	0.1	1425			257	7.3	
RA-40	04/13/1999	0.1	1420	14.9	14	437	8.4	
RA-40	05/10/1999	0.1	1500	21.5	9.4	430	7.6	318
RA-40	06/11/1999	0.1	1325	22.3	5.3	209	6.9	
RA-40	06/15/1999	0.1	1330	18.5	7.3	565	7.5	
RA-40	07/13/1999	0.1	1635	28.3	10.8	473	8.2	
RA-40	08/18/1999	0.1	1500	29.7	8.3	584	8	
RA-40	09/13/1999	0.1	1430	20.2	8	459	7.8	
RA-40	10/13/1999	0.1	1520	18.4	17.4	509	8.3	
RA-40	11/15/1999	0.1	1445	11.7	15.7	620	8.2	
RA-41	03/17/1999	0.1	0840			220	6.9	
RA-41	04/13/1999	0.1	0830	11.9	9.1	398	7.5	
RA-41	05/11/1999	0.1	0820	17.4	6.9	457	7.7	
RA-41	06/11/1999	0.1	0805	21.2	4.7	160	6.6	
RA-41	06/15/1999	0.1	0830	18	4.7			
RA-41	07/13/1999	0.1	0912	20.9	5.8	398	7.3	
RA-41	08/18/1999	0.1	0900	22.7	5	325	7.2	
RA-41	09/13/1999	0.1	0830	16.3	6	416	7.4	
RA-41	10/13/1999	0.1	0910	14.7	5	494	7.5	
RA-41	11/15/1999	0.1	0910	7.5	9.2	539	7.5	
RA-42	03/17/1999	0.1	0930			272	7	
RA-42	04/13/1999	0.1	0910	10.8	9	385	7.3	
RA-42	05/11/1999	0.1	0900	18.2	6.6	444	7.6	
RA-42	06/11/1999	0.1	0845	20.7	5.3	169	6.6	
RA-42	06/15/1999	0.1	0900	19	5			
RA-42	07/13/1999	0.1	0952	20.7	4.6	399	6.9	
RA-42	08/18/1999	0.1	0930	22.6	2.1	377	7.1	
RA-42	09/13/1999	0.1	0905	13.4	4.4	315	7.4	
RA-42	10/13/1999	0.1	0940	11.8	2.6	474	7.4	
RA-42	11/15/1999	0.1		6.4	8.3	562	7.3	
RA-43	05/10/1999	0.1	1530	18.6	8	449	7.3	309
RA-43	06/11/1999	0.1	1300	21.6	5.5	254	6.8	
RA-43	06/15/1999	0.1	1300	16.7	7.4	378	7.5	
RA-43	07/13/1999	0.1	1440	20.9	7.1	404	7.3	
RA-43	08/18/1999	0.1	1430	23.6	4.3	269	7.9	
RA-43	09/13/1999	0.1	1345	15.2	3.6	356	7.4	
RA-43	10/13/1999	0.1	DRY					

Appendix Table 2. 1999 Stream Data (Part 1)

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L	Turbidity NTU	TSS mg/L	Chlor ug/L
RA-12	0.1	03/17/1999	1245	0.18	<0.05	0.05	<0.04	0.1	2.81	1.9	4.81	0.9	0.07	330	785	
RA-12	0.1	04/13/1999	1240	0.08	<0.05	<0.05	<0.04	0.04	0.56	0.33	0.93	0.12	0.06	19	25	
RA-12	0.1	05/11/1999	1300	0.28	<0.05	0.09	<0.04	U	0.17	0.51	0.68	0.41	0.06	23	26	2.1
RA-12	0.1	06/11/1999	1145	25.7	0.38	4.81	0.32	0.17	1.34	3.93	5.44	1.35	0.09	1206	1492	
RA-12	0.1	06/15/1999	1145	13.5	0.22	2.86	0.16	0.02	0.78	1.03	1.83	0.26	0.07	96	109	
RA-12	0.1	07/13/1999	1330	1.31	0.09	0.76	0.08	0.06	U	0.68	0.74	0.11	0.02	15	22	7.4
RA-12	0.1	08/18/1999	1300	0.43	0.06	0.26	0.05	0.15	0.06	0.38	0.59	0.13	0.08	38	51	87.3
RA-12	0.1	09/13/1999	1240	0.18	<0.05	0.2	<0.04	0.04	U	0.48	0.52	0.1	0.03	23	28	1.3
RA-12	0.1	10/13/1999	1315	0.09	0.06	<0.05	<0.04	0.03	U	0.54	0.57	0.23	0.15	18	16	3.1
RA-12	0.1	11/15/1999	1335	0.12	0.08	0.1	<0.04	U	U	0.2	0.2	0.1	0.09	7.8	2.6	0
RA-15	0.1	03/17/1999	0745	0.29	<0.05	0.14	0.05	0.22	2.86	1.73	4.81	0.98	0.13	380	685	
RA-15	0.1	04/13/1999	0800	0.44	0.08	0.19	0.11	0.25	4.02	1.48	5.75	0.4	0.18	107	118	
RA-15	0.1	05/11/1999	0800	0.17	0.05	0.2	0.04	U	0.43	1.15	1.58	0.51	0.05	65	92	48
RA-15	0.1	06/11/1999	0735	25.2	0.18	4.01	0.37	0.2	2.02	3.96	6.18	1.18	0.11	870	1219	
RA-15	0.1	06/15/1999	0800	24.2	0.28	9.2	1.42	0.1	1.13	2.55	3.78	0.67	0.11	395	444	
RA-15	0.1	07/13/1999	0840	3.33	0.14	2.48	0.54	0.15	1.23	1.38	2.76	0.26	0.06	93	102	3.2
RA-15	0.1	08/18/1999	0830	2.38	0.1	0.57	0.25	0.06	0.42	0.53	1.01	0.2	0.15	49	61	5.5
RA-15	0.1	09/13/1999	0800	0.84	0.1	0.29	0.1	0.02	U	0.72	0.74	0.11	0.05	36	104	1.5
RA-15	0.1	10/13/1999	0830	0.41	0.15	0.18	0.19	0.02	U	0.76	0.78	0.17	0.09	29	41	3.3
RA-15	0.1	11/15/1999	0835	0.3	0.17	0.25	<0.04	U	U	0.8	0.8	0.29	0.21	21	21	3.1
RA-32	0.1	03/17/1999	1000	0.37	0.06	0.45	0.07	0.26	5.6	1.69	7.55	0.59	0.19	165	242	
RA-32	0.1	04/13/1999	0940	0.46	0.14	0.45	0.15	0.73	3.09	0.88	4.7	0.22	0.12	49	58	
RA-32	0.1	05/11/1999	0940	0.55	0.07	0.27	0.06	0.1	0.95	0.95	2	0.49	0.06	37	43	
RA-32	0.1	06/11/1999	0915	56.2	1.9	24.7	1.58	0.4	3.63	4.71	8.74	1.36	0.17	1053	1145	
RA-32	0.1	06/15/1999	0930	23.3	0.36	10.1	0.3	0.18	2.96	1.8	4.94	0.36	0.07	181	180	
RA-32	0.1	07/13/1999	1032	9.6	1.82	3.77	0.31	0.37	1.5	1.59	3.46	0.21	0.03	114	183	
RA-32	0.1	08/18/1999	1000	1.9	0.35	1.11	0.12	0.11	0.44	0.56	1.11	0.17	0.13	160	389	
RA-32	0.1	09/13/1999	0940	0.77	0.15	0.44	0.05				0			29	58	
RA-32	0.1	10/13/1999	1025	0.85	0.19	0.44	0.16	U	U	1.15	1.15	0.3	0.16	21	32	
RA-32	0.1	11/15/1999	1040	0.89	0.24	0.64	0.05	U	U	0.86	0.86	0.41	0.31	15	9.3	
RA-33	0.1	03/17/1999	1020	0.31	0.05	<0.05	0.04	0.33	6.92	2.5	9.75	0.97	0.21	330	590	
RA-33	0.1	04/13/1999	1010	0.28	0.08	0.09	0.08	0.17	5.32	0.96	6.45	0.22	0.13	52	50	
RA-33	0.1	05/11/1999	1000	0.16	<0.05	0.14	<0.04	U	0.11	0.69	0.8	0.4	0.03	16	21	
RA-33	0.1	06/11/1999	0930	63.4	0.55	25.7	0.88	0.23	2.55	6.24	9.02	1.7	0.16	1660	1135	
RA-33	0.1	06/15/1999	0945	20.7	0.25	8.1	0.41	U	2.57	1.4	3.97	0.25	0.08	98	99	
RA-33	0.1	07/13/1999	1050	1.95	0.21	2.26	0.17	0.14	1.21	1.32	2.67	0.26	0.01	45	37	
RA-33	0.1	08/18/1999	1030	0.34	0.07	0.23	0.05	0.05	0.29	0.37	0.71	0.14	0.12	26	30	
RA-33	0.1	09/13/1999	1000	0.3	<0.05	0.15	<0.04	0.11	U	0.63	0.74	0.14	0.05	10	15	
RA-33	0.1	10/13/1999	1040	0.28	0.07	0.08	0.34			0				13	32	
RA-33	0.1	11/15/1999	1100	0.22	<0.05	0.22	<0.04	U	U	0.48	0.48	0.16	0.12	5	9.9	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L	Turbidity NTU	TSS mg/L	Chlor ug/L
RA-34	0.1	03/17/1999	1345	2.18	1.03	1.59	0.75	0.39	1.44	0.92	2.75	0.18	0.04	24	25	
RA-34	0.1	04/13/1999	1345	0.56	0.36	0.24	0.18	0.04	0.43	0.14	0.61	0.07	0.04	21	17	
RA-34	0.1	05/11/1999	1400	1.53	0.82	1.25	1.2	0.18	0.43	1.31	1.92	0.44	0.01	25	20	
RA-34	0.1	06/11/1999	1235	18.8	0.88	3.53	0.7	0.08	0.08	5.22	5.38	0.38	0.05	93	71	
RA-34	0.1	06/15/1999	1230	2.9	0.27	1.18	0.21	0.04	0.66	0.61	1.31	0.08	0.05	16	24	
RA-34	0.1	07/13/1999	1600	0.6	0.64	0.24	0.11	0.16	0.43	0.75	1.34	0.16	0.05	17	58	
RA-34	0.1	08/18/1999	1400	0.23	0.69	0.14	0.06	0.12	0.24	0.39	0.75	0.22	0.1	47	86	
RA-34	0.1	10/13/1999	1040					0.08	U	0.7	0.78	0.33	0.27			
RA-35	0.1	03/17/1999	1120	0.17	<0.05	<0.05	<0.04	0.2	3.16	0.78	4.14	0.4	0.04	135	210	
RA-35	0.1	04/13/1999	1110	0.09	<0.05	0.05	<0.04	0.04	0.46	0.39	0.89	0.1	0.05	20	17	
RA-35	0.1	05/11/1999	1105	0.31	<0.05	0.15	<0.04	U	0.71	0.72	1.43	0.44	0.05	34	32	
RA-35	0.1	06/11/1999	1020	35.1	0.47	4.76	0.48	0.34	2.99	4.48	7.81	1.07	0.11	743	718	
RA-35	0.1	06/15/1999	1030	14.9	0.34	1.57	0.23	0.07	1.36	1.28	2.71	0.29	0.07	125	107	
RA-35	0.1	07/13/1999	1153	1.08	0.23	1.52	0.08	0.02	0.18	0.7	0.9	0.11	0.02	29	40	
RA-35	0.1	08/18/1999	1130	1.26	0.18	0.87	0.06	0.09	0.03	0.53	0.65	0.15	0.09	51	66	
RA-35	0.1	09/13/1999	1100	0.7	0.09	0.64	<0.04	0.06	0.05	0.83	0.94	0.12	0.03	47	51	
RA-35	0.1	10/13/1999	1150	0.57	0.1	0.36	0.11	0.03	U	0.79	0.82	0.3	0.18	36	32	
RA-36	0.1	03/17/1999	1100	0.24	<0.05	0.09	<0.04	0.29	5.7	1.29	7.28	0.45	0.09	175	263	
RA-36	0.1	04/13/1999	1040	0.2	0.05	0.07	<0.04	0.09	1.53	0.33	1.95	0.09	0.05	16	15	
RA-36	0.1	05/11/1999	1045	0.15	<0.05	0.07	<0.04	U	U	0.37	0.37	0.37	0.03	36	13	
RA-36	0.1	06/11/1999	1005	27.7	0.48	10.5	0.36	0.22	1.71	3.18	5.11	0.9	0.11	573	663	
RA-36	0.1	06/15/1999	1015	20.7	0.17	2.86	0.24	0.08	0.96	0.95	1.99	0.2	0.06	60	68	
RA-36	0.1	07/13/1999	1134	2.59	0.09	1.47	0.18	0.13	0.37	0.89	1.39	0.13	0.03	20	28	
RA-36	0.1	08/18/1999	1100	0.65	0.05	0.26	0.06	0.16	0.2	0.36	0.72	0.13	0.16	21	34	
RA-36	0.1	09/13/1999	1035	0.31	0.07	0.15	<0.04	0.06	U	0.45	0.51	0.1	0.06	6	19	
RA-36	0.1	10/13/1999	1125	0.25	0.05	0.18	0.08	U	U	0.64	0.64	0.4	0.37	5	6.9	
RA-36	0.1	11/15/1999	1140	0.08	0.05	0.12	<0.04	U	U	0.75	0.75	0.29	0.09	6.5	18	
RA-37	0.1	03/17/1999	1230	0.17	<0.05	<0.05	<0.04	0.26	3.52	1.42	5.2	0.73	0.08	235	510	
RA-37	0.1	04/13/1999	1220	0.07	<0.05	<0.05	<0.04	U	0.21	0.14	0.35	0.05	0.04	14	11	
RA-37	0.1	05/11/1999	1240	0.83	<0.05	0.28	0.07	U	0.84	0.59	1.43	0.45	0.05	9.5	31	
RA-37	0.1	06/11/1999	1125	30.1	0.28	4.5	0.33	0.19	1.05	2.42	3.66	0.55	0.09	275	425	
RA-37	0.1	06/15/1999	1130	11.6	0.11	2.44	0.21	0.04	0.41	0.72	1.17	0.15	0.09	27	34	
RA-37	0.1	07/13/1999	1310	1.34	0.06	0.78	0.08	0.03	U	0.75	0.78	0.13	0.01	16	29	
RA-37	0.1	08/18/1999	1230	1.19	<0.05	0.19	0.06	0.33	U	0.49	0.82	0.09	0.06	35	47	
RA-37	0.1	09/13/1999	1210	0.28	<0.05	0.1	<0.04	0.07	0.06	0.68	0.81	0.11	0.01	9	14	
RA-37	0.1	10/13/1999	1300	0.18	<0.05	0.09	0.07	0.12	U	0.8	0.92	0.08	0.01	22	26	
RA-37	0.1	11/15/1999	1310	0.12	<0.05	0.09	<0.04	U	U	1.45	1.45	0.36	0.04	6.5	3.9	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L	Turbidity NTU	TSS mg/L	Chlor ug/L
RA-38	0.1	03/17/1999	1300	0.15	<0.05	<0.05	<0.04	0.16	3.87	1.31	5.34	0.55	0.09	245	356	
RA-38	0.1	04/13/1999	1305	0.07	<0.05	<0.05	<0.04	0.05	U	0.18	0.23	0.06	0.02	12	11	
RA-38	0.1	05/11/1999	1330	0.78	<0.05	0.33	0.05	0.04	0.13	1.06	1.23	0.55	0.03	80	212	
RA-38	0.1	06/11/1999	1200	27.4	0.32	4.65	0.45	0.24	0.92	2.4	3.56	0.56	0.1	295	439	
RA-38	0.1	06/15/1999	1215	2.54	0.08	1.42	0.14	U	0.53	0.72	1.25	0.13	0.06	51	122	
RA-38	0.1	07/13/1999	1355	0.92	0.06	0.49	0.09	0.02	U	0.76	0.78	0.09	U	19	11	
RA-38	0.1	08/18/1999	1330	3.94	<0.05	0.09	0.05	0.1	U	0.49	0.59	0.08	0.04	34	59	
RA-38	0.1	10/13/1999	1125					U	U	0.64	0.64	0.4	0.37			
RA-38	0.1	11/15/1999	1140					U	U	0.75	0.75	0.29	0.09			
RA-39	0.1	03/17/1999	1200	0.25	<0.05	<0.05	<0.04	0.11	1.79	1.36	3.26	0.52	0.06	175	330	
RA-39	0.1	04/13/1999	1155	0.15	<0.05	0.12	<0.04	0.38	0.23	0.39	1	0.1	0.06	16	24	
RA-39	0.1	05/11/1999	1200	0.26	<0.05	0.14	<0.04	U	0.06	0.92	0.98	0.4	0.03	15	18	
RA-39	0.1	06/11/1999	1100	17.6	0.19	2.04	0.28	0.24	0.86	2.61	3.71	0.57	0.08	316	452	
RA-39	0.1	06/15/1999	1100	4.51	0.06	1.08	0.13	0.08	0.42	0.9	1.4	0.22	0.06	64	87	
RA-39	0.1	07/13/1999	1241	0.63	0.06	0.26	0.07	0.14	0.04	0.87	1.05	0.13	0.03	34	47	
RA-39	0.1	08/18/1999	1200	0.19	0.09	0.98	0.08	0.17	0.14	0.47	0.78	0.17	0.11	67	120	
RA-39	0.1	09/13/1999	1135	0.11	<0.05	<0.05	<0.04	0.04	0.04	1.87	1.95	0.28	0.05	49	76	
RA-39	0.1	10/13/1999	1230	0.1	<0.05	0.09	0.07	0.05	U	1.98	2.03	0.54	0.27	34	44	
RA-39	0.1	11/15/1999	1240	0.11	<0.05	0.13	<0.04	U	U	1.45	1.45	0.36	0.25	25	23	
RA-40	0.1	03/17/1999	1425	0.12	<0.05	<0.05	<0.04	0.03	3.52	2.59	6.14	1.1	0.1	115	165	
RA-40	0.1	04/13/1999	1420	0.08	<0.05	0.01	<0.04	0.4	U	0.51	0.91	0.15	0.07	12	9	
RA-40	0.1	05/11/1999	1450	0.22	<0.05	<0.05	<0.04	0.09	0.78	1.01	1.88	0.43	0.05	26	19	2.2
RA-40	0.1	06/11/1999	1325	34.1	0.3	19.4	0.43	0.15	1.91	2.8	4.86	0.66	0.1	434	396	
RA-40	0.1	06/15/1999	1330	11.3	0.08	3.65	0.18	1.79	0.68	2.92	5.39	0.45	0.29	69	74	
RA-40	0.1	07/13/1999	1635	1.44	0.08	1.42	0.13	0.08	0.06	1.25	1.39	0.18	0.03	65	233	
RA-40	0.1	08/18/1999	1500	1.3	<0.05	0.12	0.09	0.26	U	1.33	1.59	0.29	0.1	156	433	
RA-40	0.1	09/13/1999	1430	0.21	<0.05	0.13	<0.04	U	U	1.44	1.44	0.23	0.03	47	75	
RA-40	0.1	10/13/1999	1520	0.07	<0.05	0.07	<0.04	0.02	0.01	1.5	1.53	0.26	0.07	143	325	
RA-40	0.1	11/15/1999	1445	0.06	<0.05	0.12	<0.04	U	0.02	0.86	0.88	0.21	0.1	30	28	
RA-41	0.1	03/17/1999	0840	0.15	<0.05	0.05	<0.04	0.03	3.52	2.59	6.14	1.1	0.1	510	952	
RA-41	0.1	04/13/1999	0830	0.08	<0.05	<0.05	<0.04	0.09	0.96	0.46	1.51	0.11	0.06	33	48	
RA-41	0.1	05/11/1999	0820	0.07	<0.05	0.07	<0.04	U	U	0.67	0.67	0.38	0.03	23	30	
RA-41	0.1	06/11/1999	0805	41.5	0.22	4.63	0.36	0.36	1.91	6.35	8.62	2.19	0.08	2204	2508	
RA-41	0.1	06/15/1999	0830	17.1	0.13	3.27	0.21	0.08	0.92	1.13	2.13	0.22	0.06	81	93	
RA-41	0.1	07/13/1999	0912	1.72	0.09	1.03	0.09	0.14	0.38	0.8	1.32	0.11	0.02	35	55	
RA-41	0.1	08/18/1999	0900	1.68	0.06	0.4	0.11	0.29	0.51	1.03	1.83	0.23	0.08	69	90	
RA-41	0.1	09/13/1999	0830	1.17	<0.05	0.33	0.07	U	U	0.96	0.96	0.19	0.02	44	68	
RA-41	0.1	10/13/1999	0910	0.76	<0.05	0.1	0.12	0.02	U	1	1.02	0.16	0.03	46	78	
RA-41	0.1	11/15/1999	0910	0.47	0.05	0.21	<0.04	U	U	0.95	0.95	0.2	0.07	42	62	42

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L	Turbidity NTU	TSS mg/L	Chlor ug/L
RA-42	0.1	03/17/1999	0930	0.15	<0.05	<0.05	<0.04	0.1	2.81	1.9	4.81	0.9	0.07	230	325	
RA-42	0.1	04/13/1999	0910	0.1	<0.05	<0.05	<0.04	0.08	1	0.52	1.6	0.17	0.07	39	91	
RA-42	0.1	05/11/1999	0900	0.05	<0.05	<0.05	<0.04	U	U	0.55	0.55	0.38	0.03	19	22	
RA-42	0.1	06/11/1999	0845	53.4	0.48	20.1	0.56	0.26	3.02	4.64	7.92	1.17	0.17	821	782	
RA-42	0.1	06/15/1999	0900	35.8	0.27	10.3	0.32	0.16	1.16	1.71	3.03	0.27	0.06	110	112	
RA-42	0.1	07/13/1999	0952	2.69	0.11	1.32	0.16	0.06	1.15	2.02	3.23	0.22	0.02	35	95	
RA-42	0.1	08/18/1999	0930	1.01	0.11	0.47	0.1	1.27	0.06	3.98	5.31	0.24	0.08	134	310	
RA-42	0.1	09/13/1999	0910					0.08	0.06	1.78	1.92	0.24	0.02	215	457	
RA-42	0.1	10/13/1999	0940	0.6	0.09	0.14	0.12	0.14	0.01	1.8	1.95	0.27	0.05	43	41	
RA-43	0.1	05/10/1999	1530	0.79	0.11	0.11	0.07	0.47	4.18	0.75	5.4	0.1	0.07	15	15	
RA-43	0.1	06/11/1999	1300	48.5	0.53	19.4	1.23	0.33	4.29	2.07	6.69	0.32	0.11	159	113	
RA-43	0.1	06/15/1999	1300	1.8	0.3	4.34	0.49	0.08	4.56	1	5.64	0.2	0.12	51	53	
RA-43	0.1	07/13/1999	1440	2.44	0.23	1.18	0.21	0.06	0.15	1.2	1.41	0.15	0.02	23	32	
RA-43	0.1	08/18/1999	1430	1.05	0.1	0.48	0.1	0.17	1.94	1.68	3.79	0.25	0.09	33	41	
RA-43	0.1	09/13/1999	1345	0.97	0.12	0.45	0.1	0.1	0.15	1.04	1.29	0.15	0.04	11	16	
															1.6	

Appendix Table 3. 1999 Stream Data (Part 2)

Station Det Limit	Depth	Date	Time	SO4	TOC	DOC	TDS	ISU-TDS	VS	ISU-TSS	ISU-VSS	ISU-IOSS	T-FE	D-FE	T-MN	D-MN
Rep Limit Unit	m	mmddyyyy	hhmm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L		ug/L	
RA-12	0.1	03/17/1999	1245					160		253	27	227				
RA-12	0.1	04/13/1999	1240					255		24	2	22				
RA-12	0.1	05/10/1999	1400	43		6.5	258		139							
RA-12	0.1	05/11/1999	1300					282				22				
RA-12	0.1	06/11/1999	1145					117		886	73	813				
RA-12	0.1	06/15/1999	1145			6.7		227		1132	132	1000	4335	U	156	50
RA-12	0.1	07/13/1999	1330	41	7.31	7.6	296	275	117	23	0	23	904	U	402	319
RA-12	0.1	08/18/1999	1300	33	6.1	6	267	269	83	45	9	36	2470	U	1250	948
RA-12	0.1	09/13/1999	1240	40	6	6.4	308	302	92	28	6	21	1290	U	1490	1340
RA-12	0.1	10/13/1999	1315	44	9.6	9.2	311	376	78	17	6	11	1650		2900	
RA-12	0.1	11/15/1999	1335	42	7.3	7.1	344		148	3	1	2	879		734	
RA-15	0.1	03/17/1999	0745					158		375	40	335				
RA-15	0.1	04/13/1999	0800					220		110	11	99				
RA-15	0.1	05/10/1999	1430	30		7.5	230		88							
RA-15	0.1	05/11/1999	0800					253				81				
RA-15	0.1	06/11/1999	0735					120		1253	95	1158				
RA-15	0.1	06/15/1999	0800			9		137		397	45	352	12292	U	431	12
RA-15	0.1	07/13/1999	0840	21	9.38	9.57	171	147	95	98	19	79	3870	U	211	91.2
RA-15	0.1	08/18/1999	0830	14	6.7	8.3	190	175	113	57	15	42	2540	U	288	193
RA-15	0.1	09/13/1999	0800	13	14.9	9.1	235	241	99	112	9	103	550	U	266	221
RA-15	0.1	10/13/1999	0830	43	8.5	8.8	285	362	81	43	10	33	1610		555	
RA-15	0.1	11/15/1999	0835	17	13.2	13.2	338		145	16	8	8	1003		3790	
RA-32	0.1	03/17/1999	1000					150		315	28	287				
RA-32	0.1	04/13/1999	0940					256		54	7	46				
RA-32	0.1	05/11/1999	0940					273				38				
RA-32	0.1	06/11/1999	0915					117		956	109	847				
RA-32	0.1	06/15/1999	0930					199		189	21	168				
RA-32	0.1	07/13/1999	1032					205		302	22	280				
RA-32	0.1	08/18/1999	1000					192		100	13	88				
RA-32	0.1	09/13/1999	0940					317		33	5	28				
RA-32	0.1	10/13/1999	1025					310		34	8	26				
RA-32	0.1	11/15/1999	1040							10	5	5				
RA-33	0.1	03/17/1999	1020					153		212	21	191				
RA-33	0.1	04/13/1999	1010					237		56	6	50				
RA-33	0.1	05/11/1999	1000					259				17				
RA-33	0.1	06/11/1999	0930					104		521	67	454				
RA-33	0.1	06/15/1999	0945					247		94	11	83				
RA-33	0.1	07/13/1999	1050					106		40	7	33				
RA-33	0.1	08/18/1999	1030					208		29	5	23				
RA-33	0.1	09/13/1999	1000					290		11	1	9				
RA-33	0.1	10/13/1999	1040					407		21	8	13				
RA-33	0.1	11/15/1999	1100							10	3	7				
RA-34	0.1	03/17/1999	1345					209		397	42	355				
RA-34	0.1	04/13/1999	1345					240		17	2	15				
RA-34	0.1	05/11/1999	1400					207				25				
RA-34	0.1	06/11/1999	1235					186		63	34	28				
RA-34	0.1	06/15/1999	1230					323		15	4	11				
RA-34	0.1	07/13/1999	1600					179		26	2	24				
RA-34	0.1	08/18/1999	1400					380		37	3	34				

Station Det Limit	Depth	Date	Time	SO4 10	TOC 0.2	DOC 0.2	TDS 5	ISU-TDS	VS 5	ISU-TSS	ISU-VSS	ISU-IOSS	T-FE 40	D-FE	T-MN 1	D-MN
Rep Limit Unit	m	mmddyyyy	hhmm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L		
RA-35	0.1	03/17/1999	1120					181		231	18	214				
RA-35	0.1	04/13/1999	1110					245		20	3	18				
RA-35	0.1	05/11/1999	1105					263				31				
RA-35	0.1	06/11/1999	1020					160		958	103	855				
RA-35	0.1	06/15/1999	1030					191		109	15	95				
RA-35	0.1	07/13/1999	1153					224		30	12	18				
RA-35	0.1	08/18/1999	1130					176		63	4	59				
RA-35	0.1	09/13/1999	1100					205		52	7	45				
RA-35	0.1	10/13/1999	1150					246		40	14	26				
RA-36	0.1	03/17/1999	1100					181		189	14	174				
RA-36	0.1	04/13/1999	1040					232		15	2	13				
RA-36	0.1	05/11/1999	1045					273				9				
RA-36	0.1	06/11/1999	1005					120		698	80	618				
RA-36	0.1	06/15/1999	1015					79		68	3	65				
RA-36	0.1	07/13/1999	1134					235		31	0	31				
RA-36	0.1	08/18/1999	1100					11		19	0	18				
RA-36	0.1	09/13/1999	1035					286		15	3	12				
RA-36	0.1	10/13/1999	1125					341		2	0	2				
RA-36	0.1	11/15/1999	1140						34		20	15				
RA-37	0.1	03/17/1999	1230					170		223	13	209				
RA-37	0.1	04/13/1999	1220					270		12	2	10				
RA-37	0.1	05/11/1999	1240					238				28				
RA-37	0.1	06/11/1999	1125					132		458	48	410				
RA-37	0.1	06/15/1999	1130					271		32	4	28				
RA-37	0.1	07/13/1999	1310					277		25	3	22				
RA-37	0.1	08/18/1999	1230					258		66	6	59				
RA-37	0.1	09/13/1999	1210					372		16	2	13				
RA-37	0.1	10/13/1999	1300					422		11	3	8				
RA-37	0.1	11/15/1999	1310						5		0	5				
RA-38	0.1	03/17/1999	1300					208		327	17	310				
RA-38	0.1	04/13/1999	1305					331		11	2	9				
RA-38	0.1	05/11/1999	1330					334		153	13	140				
RA-38	0.1	06/11/1999	1200					156		425	48	377				
RA-38	0.1	06/15/1999	1215					312		36	5	31				
RA-38	0.1	07/13/1999	1355					300		25	7	18				
RA-38	0.1	08/18/1999	1330					226		60	8	51				
RA-39	0.1	03/17/1999	1200					188		720	21	699				
RA-39	0.1	04/13/1999	1155					251		20	3	17				
RA-39	0.1	05/11/1999	1200					272		21	3	18				
RA-39	0.1	06/11/1999	1100					168		299	35	264				
RA-39	0.1	06/15/1999	1100					244		76	10	65				
RA-39	0.1	07/13/1999	1241					88		31	3	29				
RA-39	0.1	08/18/1999	1200					265		72	10	62				
RA-39	0.1	09/13/1999	1135					361		43	19	24				
RA-39	0.1	10/13/1999	1230					383		37	14	24				
RA-39	0.1	11/15/1999	1240						21		9	12				

Station Det Limit	Depth	Date	Time	SO4 10 20	TOC 0.2 1	DOC 0.2 1	TDS 5 10	ISU-TDS mg/L	VS 5 10	ISU-TSS mg/L	ISU-VSS mg/L	ISU-IOSS mg/L	T-FE 40 120	D-FE	T-MN 1 4	D-MN	
Rep Limit Unit	m	mmddyyyy	hhmm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L		ug/L		
RA-40	0.1	03/17/1999	1425					170		243	10	233					
RA-40	0.1	04/13/1999	1420					288		7	2	5					
RA-40	0.1	05/10/1999	1500	32		6.2	246		66	23				1070	U	304	279
RA-40	0.1	05/11/1999	1450					271			3	20					
RA-40	0.1	06/11/1999	1325					138		317	46	271					
RA-40	0.1	06/15/1999	1330					373		78	12	67					
RA-40	0.1	07/13/1999	1635					312		260	28	233					
RA-40	0.1	08/18/1999	1500					385		25	4	21					
RA-40	0.1	09/13/1999	1430					303		99	20	79					
RA-40	0.1	10/13/1999	1520					336		83	9	74					
RA-40	0.1	11/15/1999	1445							24	5	19					
RA-41	0.1	03/17/1999	0840					145		22	3	19					
RA-41	0.1	04/13/1999	0830					263		44	5	39					
RA-41	0.1	05/11/1999	0820					302		30	4	25					
RA-41	0.1	06/11/1999	0805					106		568	58	510					
RA-41	0.1	06/15/1999	0830							97	13	84					
RA-41	0.1	07/13/1999	0912					263		51	7	44					
RA-41	0.1	08/18/1999	0900					215		88	4	84					
RA-41	0.1	09/13/1999	0830					275		63	8	55					
RA-41	0.1	10/13/1999	0910					326		57	9	47					
RA-41	0.1	11/15/1999	0910							58	13	45					
RA-42	0.1	03/17/1999	0930					180		131	8	123					
RA-42	0.1	04/13/1999	0910					254		70	6	64					
RA-42	0.1	05/11/1999	0900					293		22	4	18					
RA-42	0.1	06/11/1999	0845					112		385	46	339					
RA-42	0.1	06/15/1999	0900							39	4	34					
RA-42	0.1	07/13/1999	0952					263		460	31	429					
RA-42	0.1	08/18/1999	0930					249		266	11	256					
RA-42	0.1	09/13/1999	0910					208		81	7	74					
RA-42	0.1	10/13/1999	0940					313		43	10	33					
RA-42	0.1	11/15/1999								NA	NA	NA					
RA-43	0.1	05/10/1999	1530		6.7	6.4	260		52					891	U	285	266
RA-43	0.1	06/11/1999	1300					168		126	16	110					
RA-43	0.1	06/15/1999	1300			5.4		249		51	4	46		2102	U	201	149
RA-43	0.1	07/13/1999	1440	27	8.53	8.8	239	267	105	33	8	26		1090	U	411	284
RA-43	0.1	08/18/1999	1430	24		9.5	191	178	79	44	1	43		952	U	348	108
RA-43	0.1	09/13/1999	1345	18	8.6	9	230	235	90	15	3	12		570	U	432	337

Appendix Table 4. 1999 Stream Data (Part 3)

Station	Depth	Date	Time	COD 3	Lab pH	Tot. Alk.	Discharge	Silica
Det Limit								
Rep Limit								
Unit	m	mmddyyyy	hhmm	mg/L		mg/L	cfs	mg/L
RA-12	0.1	03/17/1999	1245			73	917	405.6
RA-12	0.1	04/13/1999	1240			153	52	46.2
RA-12	0.1	05/10/1999	1400			160	31	52
RA-12	0.1	05/11/1999	1300					
RA-12	0.1	06/11/1999	1145			64	575	841.8
RA-12	0.1	06/15/1999	1145			136	53	287.8
RA-12	0.1	07/13/1999	1330		7.6	176	5.3	25.5
RA-12	0.1	08/18/1999	1300		7.4	175	2.6	53.8
RA-12	0.1	09/13/1999	1240		7.4	190	1.3	42.3
RA-12	0.1	10/13/1999	1315		7.4	210	0.85	34.9
RA-12	0.1	11/15/1999	1335	24			2	24.4
RA-15	0.1	03/17/1999	0745			81	1170	437.2
RA-15	0.1	04/13/1999	0800			103	52	123.9
RA-15	0.1	05/10/1999	1430			144	58	90.9
RA-15	0.1	05/11/1999	0800					
RA-15	0.1	06/11/1999	0735			67	1040	846.3
RA-15	0.1	06/15/1999	0800			92	112	667.7
RA-15	0.1	07/13/1999	0840		7	82	e17	66.2
RA-15	0.1	08/18/1999	0830		7	100	4	72.9
RA-15	0.1	09/13/1999	0800		7.6	145	1.3	38.9
RA-15	0.1	10/13/1999	0830		7.5	138	1.5	37.2
RA-15	0.1	11/15/1999	0835	41			1.3	31.2
RA-32	0.1	03/17/1999	1000			51	121	204.3
RA-32	0.1	04/13/1999	0940			163	2.1	83.8
RA-32	0.1	05/11/1999	0940			163	1.7	70
RA-32	0.1	06/11/1999	0915			48	e170	990
RA-32	0.1	06/15/1999	0930				7.3	378.8
RA-32	0.1	07/13/1999	1032			123	63	52.9
RA-32	0.1	08/18/1999	1000				2.2	97.1
RA-32	0.1	09/13/1999	0940				0	35.2
RA-32	0.1	10/13/1999	1025				0	42.1
RA-32	0.1	11/15/1999	1040				0	28.7
RA-33	0.1	03/17/1999	1020			54	65	405.9
RA-33	0.1	04/13/1999	1010			125	3.5	95.5
RA-33	0.1	05/11/1999	1000			166	1.4	43.2
RA-33	0.1	06/11/1999	0930			51	34	1043.4
RA-33	0.1	06/15/1999	0945				1.8	292.6
RA-33	0.1	07/13/1999	1050			112	191	46.2
RA-33	0.1	08/18/1999	1030				0.44	46.4
RA-33	0.1	09/13/1999	1000				0.11	18.1

Station	Depth	Date	Time	COD	Lab pH	Tot. Alk.	Discharge	Silica
Det Limit				3				
Rep Limit								
Unit	m	mmddyyyy	hhmm	mg/L		mg/L	cfs	mg/L
RA-33	0.1	10/13/1999	1040			0	28.5	
RA-33	0.1	11/15/1999	1100			0.007	33.1	
RA-34	0.1	03/17/1999	1345		107	0.13	63.8	
RA-34	0.1	04/13/1999	1345		174	0.004	53	
RA-34	0.1	05/11/1999	1400		126	0.04	57	
RA-34	0.1	06/11/1999	1235		119	0.04	157.6	
RA-34	0.1	06/15/1999	1230			0.004	199.3	
RA-34	0.1	07/13/1999	1600		336	0	27.3	
RA-34	0.1	08/18/1999	1400			0	62.4	
RA-35	0.1	03/17/1999	1120		78	89	174.6	
RA-35	0.1	04/13/1999	1110		152	5.9	44.3	
RA-35	0.1	05/11/1999	1105		154	2.8	65.2	
RA-35	0.1	06/11/1999	1020		75	23	930.4	
RA-35	0.1	06/15/1999	1030			9.1	324.5	
RA-35	0.1	07/13/1999	1153		156	198	46.8	
RA-35	0.1	08/18/1999	1130			5	63.6	
RA-35	0.1	09/13/1999	1100			0.12	75.2	
RA-35	0.1	10/13/1999	1150			0	49.3	
RA-36	0.1	03/17/1999	1100		69	41	207.9	
RA-36	0.1	04/13/1999	1040		154	5.4	42.8	
RA-36	0.1	05/11/1999	1045		180	1.4	45.5	
RA-36	0.1	06/11/1999	1005		67	42	757.8	
RA-36	0.1	06/15/1999	1015			15	223.6	
RA-36	0.1	07/13/1999	1134		158	0	34.9	
RA-36	0.1	08/18/1999	1100			0.23	36.1	
RA-36	0.1	09/13/1999	1035			0	22.8	
RA-36	0.1	10/13/1999	1125			0.04	26.3	
RA-36	0.1	11/15/1999	1140			0.02	26.1	
RA-37	0.1	03/17/1999	1230		71	62	315.5	
RA-37	0.1	04/13/1999	1220		156	4.8	26.1	
RA-37	0.1	05/11/1999	1240		146	2.2	77.7	
RA-37	0.1	06/11/1999	1125		76	47	451.2	
RA-37	0.1	06/15/1999	1130			4.3	196.2	
RA-37	0.1	07/13/1999	1310		188	2.6	32.6	
RA-37	0.1	08/18/1999	1230			0.06	43.2	
RA-37	0.1	09/13/1999	1210			0	30.4	
RA-37	0.1	10/13/1999	1300			0	29.4	
RA-37	0.1	11/15/1999	1310			0	14.1	
RA-38	0.1	03/17/1999	1300		96	60	316.3	
RA-38	0.1	04/13/1999	1305		21	79	28	

Station	Depth	Date	Time	COD	Lab pH	Tot. Alk.	Discharge	Silica
Det Limit				3				
Rep Limit								
Unit	m	mmddyyyy	hhmm	mg/L		mg/L	cfs	mg/L
RA-38	0.1	05/11/1999	1330			197	11	78.4
RA-38	0.1	06/11/1999	1200			90	43	461.3
RA-38	0.1	06/15/1999	1215				8.4	175.1
RA-38	0.1	07/13/1999	1355			194	2.8	38.5
RA-38	0.1	08/18/1999	1330				0.28	43.3
RA-39	0.1	03/17/1999	1200			89	228	205.1
RA-39	0.1	04/13/1999	1155			151	12	36.3
RA-39	0.1	05/11/1999	1200			166	7.9	64.2
RA-39	0.1	06/11/1999	1100			100	57	515.1
RA-39	0.1	06/15/1999	1100				264	204
RA-39	0.1	07/13/1999	1241			164	99	52.4
RA-39	0.1	08/18/1999	1200				0.18	74.2
RA-39	0.1	09/13/1999	1135				0	82.9
RA-39	0.1	10/13/1999	1230				0	72.3
RA-39	0.1	11/15/1999	1240				0	46.9
RA-40	0.1	03/17/1999	1425			94	32	174.6
RA-40	0.1	04/13/1999	1420			170	56	26.5
RA-40	0.1	05/10/1999	1500			158	4	72.5
RA-40	0.1	05/11/1999	1450					
RA-40	0.1	06/11/1999	1325				24	634.2
RA-40	0.1	06/15/1999	1330				6.4	215.6
RA-40	0.1	07/13/1999	1635			188	15	46.7
RA-40	0.1	08/18/1999	1500				0.22	69.8
RA-40	0.1	09/13/1999	1430				0	60.1
RA-40	0.1	10/13/1999	1520				0	57.5
RA-40	0.1	11/15/1999	1445				0	43
RA-41	0.1	03/17/1999	0840			53	e569	566.9
RA-41	0.1	04/13/1999	0830			150	11	61.7
RA-41	0.1	05/11/1999	0820			185	2.2	56.7
RA-41	0.1	06/11/1999	0805			58	e749	982
RA-41	0.1	06/15/1999	0830				7.4	237.7
RA-41	0.1	07/13/1999	0912			173	970	58.4
RA-41	0.1	08/18/1999	0900				1.4	98.4
RA-41	0.1	09/13/1999	0830				0	71.3
RA-41	0.1	10/13/1999	0910				0	59.7
RA-41	0.1	11/15/1999	0910				0	67.6
RA-42	0.1	03/17/1999	0930			66	12	285.8
RA-42	0.1	04/13/1999	0910			147	381	68.4
RA-42	0.1	05/11/1999	0900			181	0.6	53.3
RA-42	0.1	06/11/1999	0845			53	e266	1021.4
RA-42	0.1	06/15/1999	0900				1.6	272.7

Station	Depth	Date	Time	COD	Lab pH	Tot. Alk.	Discharge	Silica
Det Limit				3				
Rep Limit								
Unit	m	mmddyyyy	hhmm	mg/L		mg/L	cfs	mg/L
RA-42	0.1	07/13/1999	0952			166	15	106.8
RA-42	0.1	08/18/1999	0930				0.11	135.7
RA-42	0.1	09/13/1999	0910				0	42.3
RA-42	0.1	10/13/1999	0940				0	178.6
RA-42	0.1	11/15/1999					0	38.4
RA-43	0.1	05/10/1999	1530			144		
RA-43	0.1	06/11/1999	1300			80	6.3	334.9
RA-43	0.1	06/15/1999	1300			126	0.99	202
RA-43	0.1	07/13/1999	1440		7.4	162	0	36.5
RA-43	0.1	08/18/1999	1430		6.8	90	0.17	50.4
RA-43	0.1	09/13/1999	1345		7.4	136	0	24.4

Appendix Table 5. 1999 Stream Data (Part 4)

Station Units	Depth m	Date mmddyyyy	Time hhmm	FC /100 mL	TC /100mL	TC MPN/100mL	ECLI /100mL	ECI MPN/100mL	FENT /100mL	FENT MPN/100mL	Cl mg/L	Caffeine ng/L
RA-12	0.1	03/17/1999	1245	300			420		270			
RA-12	0.1	04/13/1999	1240	200			200		64			
RA-12	0.1	05/11/1999	1300		1500		330		330			
RA-12	0.1	06/11/1999	1145			>2400		>2400		>2400		
RA-12	0.1	06/15/1999	1145			58000		740		510		
RA-12	0.1	07/13/1999	1330			8700		100		30		
RA-12	0.1	08/18/1999	1300			28000		1300		<100	3.2	<40
RA-12	0.1	09/13/1999	1240			12000		470		63		
RA-12	0.1	10/13/1999	1315			>24000		210		63	3	
RA-12	0.1	11/15/1999	1335			1000		31		10	3	
RA-15	0.1	03/17/1999	0745	420			340		630			
RA-15	0.1	04/13/1999	0800	470			460		100			
RA-15	0.1	05/11/1999	0800		600		30		70			
RA-15	0.1	06/11/1999	0735			>2400		>2400		>2400		
RA-15	0.1	06/15/1999	0800			100000		1600		1300		
RA-15	0.1	07/13/1999	0840			>24000		340		220		
RA-15	0.1	08/18/1999	0830			24000		630		310	2.3	<40
RA-15	0.1	09/13/1999	0800			14000		300		210		
RA-15	0.1	10/13/1999	0830			3900		310		200	7.3	
RA-15	0.1	11/15/1999	0835			1000		52		110	7.8	
RA-16	0.1	08/17/1999		14								
RA-18	0.1	06/14/1999		11								
RA-18	0.1	07/12/1999		45								
RA-18	0.1	08/17/1999		10								
RA-20	0.1	06/14/1999		18								
RA-20	0.1	07/12/1999		80								
RA-20	0.1	08/17/1999		19								
RA-30	0.1	07/12/1999		20								
RA-30	0.1	08/17/1999		16								
RA-31	0.1	06/14/1999		80								
RA-31	0.1	07/12/1999		0								
RA-31	0.1	08/17/1999		18								
RA-32	0.1	03/17/1999	1000	150			110		260			
RA-32	0.1	04/13/1999	0940	470			460		45			
RA-32	0.1	05/11/1999	0940		900		200		110			
RA-32	0.1	06/11/1999	0915			>2400		>2400		>2400		
RA-32	0.1	06/15/1999	0930			73000		740		310		
RA-32	0.1	07/13/1999	1032			>24000		210		250		
RA-32	0.1	08/18/1999	1000			58000		850		1900	2.6	<40
RA-32	0.1	09/13/1999	0940			>24000		51		260		
RA-32	0.1	10/13/1999	1025			2100		210		30	3.2	
RA-32	0.1	11/15/1999	1040			350		10		41	2.7	
RA-33	0.1	03/17/1999	1020	200			450		330			
RA-33	0.1	04/13/1999	1010	230			370		120			
RA-33	0.1	05/11/1999	1000		910		100		90			
RA-33	0.1	06/11/1999	0930			>2400		>2400		>2400		
RA-33	0.1	06/15/1999	0945			65000		970		1200		
RA-33	0.1	07/13/1999	1050			>24000		490		540		
RA-33	0.1	08/18/1999	1030			25000		300		200	0.7	<40
RA-33	0.1	09/13/1999	1000			2200		74		63		
RA-33	0.1	10/13/1999	1040			4000		62		<10	2.8	
RA-33	0.1	11/15/1999	1100			1300		<10		10	2.5	

Station Units	Depth m	Date mmddyyyy	Time hhmm	FC /100 mL	TC /100mL	TC MPN/100mL	ECLI /100mL	ECI MPN/100mL	FENT /100mL	FENT MPN/100mL	Cl mg/L	Caffeine ng/L
RA-34	0.1	03/17/1999	1345	55			30		150			
RA-34	0.1	04/13/1999	1345	260			180		40			
RA-34	0.1	05/11/1999	1400		2100		930		1300			
RA-34	0.1	06/11/1999	1235			>2400		820		2000		
RA-34	0.1	06/15/1999	1230			44000		4400		1900		
RA-34	0.1	07/13/1999	1600			14000		1600		1100		
RA-34	0.1	08/18/1999	1400			130000		1600		6500	3.5	26E
RA-35	0.1	03/17/1999	1120	40			100		250			
RA-35	0.1	04/13/1999	1110	350			350		60			
RA-35	0.1	05/11/1999	1105		1400		400		200			
RA-35	0.1	06/11/1999	1020			>2400		>2400		>2400		
RA-35	0.1	06/15/1999	1030			41000		630		730		
RA-35	0.1	07/13/1999	1153			6900		100		10		
RA-35	0.1	08/18/1999	1130			26000		200		100	1.3	<40
RA-35	0.1	09/13/1999	1100			7300		620		160		
RA-35	0.1	10/13/1999	1150			1600		85		20	0.2	
RA-36	0.1	03/17/1999	1100	570			280		240			
RA-36	0.1	04/13/1999	1040	91			170		140			
RA-36	0.1	05/11/1999	1045		2000		540		240			
RA-36	0.1	06/11/1999	1005			>2400		>2400		>2400		
RA-36	0.1	06/15/1999	1015			49000		970		100		
RA-36	0.1	07/13/1999	1134			14000		450		40		
RA-36	0.1	08/18/1999	1100			12000		1200		<100	2.1	20E
RA-36	0.1	09/13/1999	1035			24000		250		41		
RA-36	0.1	10/13/1999	1125			5200		350		280	2.1	
RA-36	0.1	11/15/1999	1140			2100		350		110	0.8	
RA-37	0.1	03/17/1999	1230	370			490		260			
RA-37	0.1	04/13/1999	1220	380			330		40			
RA-37	0.1	05/11/1999	1240		1300		520		220			
RA-37	0.1	06/11/1999	1125			>2400		>2400		>2400		
RA-37	0.1	06/15/1999	1130			25000		200		200		
RA-37	0.1	07/13/1999	1310			>24000		50		190		
RA-37	0.1	08/18/1999	1230			25000		1300		100	1.8	43
RA-37	0.1	09/13/1999	1210			7300		41		85		
RA-37	0.1	10/13/1999	1300			11000		20		51	0.2	
RA-37	0.1	11/15/1999	1310			3100		<10		<10	0.1	
RA-38	0.1	03/17/1999	1300	330			260		270			
RA-38	0.1	04/13/1999	1305	240			250		210			
RA-38	0.1	05/11/1999	1330		17000		4100		4800			
RA-38	0.1	06/11/1999	1200			>2400		>2400		>2400		
RA-38	0.1	06/15/1999	1215			41000		630		740		
RA-38	0.1	07/13/1999	1355			20000		60		20		
RA-38	0.1	08/18/1999	1330			22000		100		<100	2.3	<40
RA-39	0.1	03/17/1999	1200	130			82		150			
RA-39	0.1	04/13/1999	1155	100			160		30			
RA-39	0.1	05/11/1999	1200		1100		240		160			
RA-39	0.1	06/11/1999	1100			>2400		>2400		>2400		
RA-39	0.1	06/15/1999	1100			34000		200		520		
RA-39	0.1	07/13/1999	1241			<10		<10		<10		
RA-39	0.1	08/18/1999	1200			44000		1700		630	5.8	39E
RA-39	0.1	09/13/1999	1135			>24000		7300		1100		
RA-39	0.1	10/13/1999	1230			4900		610		10	6	
RA-39	0.1	11/15/1999	1240			8200		180		210	7.7	

Station Units	Depth m	Date mmddyyyy	Time hhmm	FC /100 mL	TC /100mL	TC MPN/100mL	ECLI /100mL	ECI MPN/100mL	FENT /100mL	FENT MPN/100mL	Cl mg/L	Caffeine ng/L
RA-40	0.1	03/17/1999	1425	110			91		100			
RA-40	0.1	04/13/1999	1420	20			27		10			
RA-40	0.1	05/11/1999	1450		1300		410		170			
RA-40	0.1	06/11/1999	1325			>2400		>2400		>2400		
RA-40	0.1	06/15/1999	1330			73000		1600		1100		
RA-40	0.1	07/13/1999	1635			>24000		930		420		
RA-40	0.1	08/18/1999	1500			25000		1500		<100		
RA-40	0.1	09/13/1999	1430			1600		510		63	8.3	<40
RA-40	0.1	10/13/1999	1520			>24000		1200		20		
RA-40	0.1	11/15/1999	1445			7300		170		130	2.6	
											4.3	
RA-41	0.1	03/17/1999	0840	430			280		380			
RA-41	0.1	04/13/1999	0830	250			280		110			
RA-41	0.1	05/11/1999	0820		500		300		130			
RA-41	0.1	06/11/1999	0805			>2400		>2400		>2400		
RA-41	0.1	06/15/1999	0830			37000		410		520		
RA-41	0.1	07/13/1999	0912			12000		190		100		
RA-41	0.1	08/18/1999	0900			29000		1600		200		
RA-41	0.1	09/13/1999	0830			5800		270		63	2.5	<40
RA-41	0.1	10/13/1999	0910			2200		200		10		
RA-41	0.1	11/15/1999	0910			620		31		10	0.9	
											0.6	
RA-42	0.1	03/17/1999	0930	560			650		290			
RA-42	0.1	04/13/1999	0910	810			760		370			
RA-42	0.1	05/11/1999	0900		1500		470		180			
RA-42	0.1	06/11/1999	0845			>2400		>2400		>2400		
RA-42	0.1	06/15/1999	0900			46000		980		1200		
RA-42	0.1	07/13/1999	0952			>24000		570		60		
RA-42	0.1	08/18/1999	0930			34000		520		310		
RA-42	0.1	09/13/1999	0910			8700		150		74	4.4	<40
RA-42	0.1	10/13/1999	0940			10000		110		210		2.4
RA-43	0.1	06/11/1999	1300			>2400		2400		>2400		0.3
RA-43	0.1	06/15/1999	1300			92000		1600		970		
RA-43	0.1	07/13/1999	1440			17000		290		160		
RA-43	0.1	08/18/1999	1430			21000		100		200		
RA-43	0.1	09/13/1999	1345			6900		63		120		

3.1 67

Appendix Table 6. Stream Data, 1997-1999

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-12	0.1	04/30/1997	1345	0.12	<0.05	0.09	<0.04	0.09	0.16	2.5	2.75	0.34		967	1363	
	0.1	05/12/1997	1345	0.7	0.05	0.26	0.2	0.02	0.51	0.8	1.33	0.11		19	36	
	0.1	05/27/1997	1530	1.04	0.11	3.75	0.57	0.09	0.08	1.1	1.27	0.21	0.07	55	79	
	0.1	06/08/1997	1545	17.32	0.26	7.16	8.16	0.06	2.39	2.1	4.55	0.18	0.12	160	187	
	0.1	06/23/1997	0830	30.2	1.24	10.15	8.3	0.3	6	4.3	10.6	0.86	0.28	1535	982	
	0.1	07/07/1997	0900	3.42	0.08	0.85	0.96	0.08	0.07	0.4	0.55	0.22	0.06	16	22	
	0.1	07/21/1997	0840	2.4	0.26	0.55	0.41	0.11	0.11	0.8	1.02	0.18	0.08	17	26	
	0.1	08/04/1997	0840	0.95	0.08	0.22	0.74	0.04	0.06	0.4	0.5	0.45	0.06	28	42	
	0.1	09/02/1997	1050	1.06	<0.05	0.29	0.22	0.05	0.12	1.2	1.37	0.16	0.08	16	22	
	0.1	09/15/1997	1010	0.86	0.1	0.19	0.19	0.11	0.07	0.9	1.08	0.18	0.07	16	19	
RA-12	0.1	04/14/1998	1535	0.11	<0.05	0.28	0.05	0.1	0.43	1.4	1.93	0.2	0.1	220	265	
	0.1	05/04/1998	1305	<0.05	<0.05	0.1	<0.04	0.02	0.04	0.6	0.66	0.14	0.04	12	18	
	0.1	05/22/1998	1345	48.7	<0.05	<0.05	4.8	0.58	2.92	7.1	10.6	1.03	0.09		1920	
	0.1	06/09/1998	1530	15.8	0.15	3.18	0.7	0.09	2.26	1.3	3.65	0.15	0.11	104	140	
	0.1	06/24/1998	1430	2.88	0.12	0.79	0.26	0.11	0.72	1.4	2.23	0.22	0.06		400	
	0.1	07/06/1998	0925	2.09	0.08	0.66	0.21	0.13	0.61	0.8	1.54	0.13	0.1	77	158	
	0.1	07/22/1998	0951	1.12	0.11	0.39	0.14	0.04	0.09	0.6	0.73	0.08	0.07		24	
	0.1	08/03/1998	1310	1.46	0.24	1.19	0.09	0.03	0.43	0.5	0.96	0.14	0.06	14	18	
	0.1	08/18/1998	1000	0.57	0.07	0.17	0.04	<0.02	0.1	0.5	0.6	0.15	0.06		22	
	0.1	08/31/1998	0900	0.36	0.05	0.09	<0.04	0.32	0.08	0.4	0.8	0.12	0.07	25	31	
	0.1	09/14/1998	1637	0.23	<0.05	0.06	<0.04	0.11	0.49	1.1	1.7	0.76	0.27			
	0.1	10/14/1998	1245	0.68	0.05	0.12	0.09	0.06	0.62	1	1.68	0.19	0.13			
	0.1	11/10/1998	1210	0.37	<0.05	0.28	<0.04	0.22	1.16	2	3.38	0.49	0.23	450	658	
RA-12	0.1	03/17/1999	1245	0.18	<0.05	0.05	<0.04	0.1	2.81	1.9	4.81	0.9	0.07	330	785	
	0.1	04/13/1999	1240	0.08	<0.05	<0.05	<0.04	0.04	0.56	0.33	0.93	0.12	0.06	19	25	
	0.1	05/11/1999	1300	0.28	<0.05	0.09	<0.04	U	0.17	0.51	0.68	0.41	0.06	23	26	
	0.1	06/11/1999	1145	25.7	0.38	4.81	0.32	0.17	1.34	3.93	5.44	1.35	0.09	1206	1492	
	0.1	06/15/1999	1145	13.5	0.22	2.86	0.16	0.02	0.78	1.03	1.83	0.26	0.07	96	109	
	0.1	07/13/1999	1330	1.31	0.09	0.76	0.08	0.06	U	0.68	0.74	0.11	0.02	15	22	
	0.1	08/18/1999	1300	0.43	0.06	0.26	0.05	0.15	0.06	0.38	0.59	0.13	0.08	38	51	
	0.1	09/13/1999	1240	0.18	<0.05	0.2	<0.04	0.04	U	0.48	0.52	0.1	0.03	23	28	
	0.1	10/13/1999	1315	0.09	0.06	<0.05	<0.04	0.03	U	0.54	0.57	0.23	0.15	18	3.1	
	0.1	11/15/1999	1335	0.12	0.08	0.1	<0.04	U	U	0.2	0.2	0.1	0.09	7.8	2.6	
RA-15	0.1	04/30/1997	1445	1.86	0.17	0.17	0.16	0.18	1.06	1.8	3.04	0.25		169	292	
	0.1	05/12/1997	1230	4.66	0.18	3.28	0.53	0.21	1.78	1.6	3.59	0.25		105	100	
	0.1	05/27/1997	1615	2.18	0.24	4.84	1.33	0.12	0.07	1.2	1.39	0.23	0.1	53	64	
	0.1	06/08/1997	1620	25	0.53	31.4	4	0.08	1.72	1.9	3.7	0.29	0.17	110	154	
	0.1	06/23/1997	0915	15.9	1.27	14.1	6.55	0.18	0.81	1.6	2.59	0.24	0.11	124	179	
	0.1	07/07/1997	0945	7.5	0.77	4.77	1.61	0.07	1.5	1	2.57	0.09	0.09	52	48	
	0.1	07/21/1997	0915	3.33	0.71	3.71	1.05	0.08	0.14	1.2	1.42	0.1	0.08	74	80	
	0.1	08/04/1997	0915	2.24	0.29	1.36	1.22	0.04	0.25	1.3	1.59	0.28	0.11	32	37	
	0.1	09/02/1997	1140	1.46	<0.05	0.66	0.67	<0.02	0.05	1.2	1.25	0.31	0.11	15	14	
	0.1	09/15/1997	1050	1.52	0.14	0.54	0.48	0.17	0.24	1	1.41	0.16	0.09	15	17	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-15	0.1	04/14/1998	1620	0.17	0.05	0.23	0.1	0.12	0.63	1.2	1.95	0.13	0.1	100	92	
	0.1	05/04/1998	1345	0.29	<0.05	0.31	0.28	0.02	0.03	0.4	0.45	0.09	0.06	41	61	
	0.1	05/22/1998	1515	39.7	0.68	14.5	1.85	0.46	2.79	5.4	8.65	0.82	0.1			
	0.1	06/09/1998	1615	17.3	0.19	2.95	0.82	0.12	1.39	1.6	3.11	0.15	0.11	148	145	
	0.1	06/23/1998	0935	14	0.31	2.68	1.36	0.12	1.13	1.6	2.85	0.14	0.1			
	0.1	07/06/1998	1000	4.27	0.39	3.97	0.44	0.1	1.24	0.8	2.14	0.18	0.14	96	105	
	0.1	07/21/1998	0930	2.44	0.11	1.04	0.37	0.1	0.28	1.1	1.48	0.24	0.08			
	0.1	08/03/1998	1400	1.91	0.22	0.74	0.26	<0.02	0.03	0.7	0.73	0.18	0.06	12	12	
	0.1	08/17/1998	0930	1.11	<0.05	0.2	0.15	0.03	0.03	1.6	1.66	0.35	0.05			
	0.1	08/31/1998	0910	1.08	0.15	0.3	0.17	0.09	0.1	0.4	0.59	0.11	0.09	15	15	
	0.1	09/15/1998	0940	0.54	0.09	0.1	0.06	0.08	0.24	1.1	1.42	0.16	0.1			
RA-15	0.1	10/13/1998	0945					0.24	0.76	1	2	0.36	0.17			
	0.1	11/10/1998	0830	2.81	<0.05	0.17	0.11	0.58	1.29	1.3	3.17	0.53	0.29	145	228	
RA-15	0.1	03/17/1999	0745	0.29	<0.05	0.14	0.05	0.22	2.86	1.73	4.81	0.98	0.13	380	685	
	0.1	04/13/1999	0800	0.44	0.08	0.19	0.11	0.25	4.02	1.48	5.75	0.4	0.18	107	118	
	0.1	05/11/1999	0800	0.17	0.05	0.2	0.04	U	0.43	1.15	1.58	0.51	0.05	65	92	
	0.1	06/11/1999	0735	25.2	0.18	4.01	0.37	0.2	2.02	3.96	6.18	1.18	0.11	870	1219	
	0.1	06/15/1999	0800	24.2	0.28	9.2	1.42	0.1	1.13	2.55	3.78	0.67	0.11	395	444	
	0.1	07/13/1999	0840	3.33	0.14	2.48	0.54	0.15	1.23	1.38	2.76	0.26	0.06	93	102	
	0.1	08/18/1999	0830	2.38	0.1	0.57	0.25	0.06	0.42	0.53	1.01	0.2	0.15	49	61	
	0.1	09/13/1999	0800	0.84	0.1	0.29	0.1	0.02	U	0.72	0.74	0.11	0.05	36	104	
	0.1	10/13/1999	0830	0.41	0.15	0.18	0.19	0.02	U	0.76	0.78	0.17	0.09	29	41	
	0.1	11/15/1999	0835	0.3	0.17	0.25	<0.04	U	U	0.8	0.8	0.29	0.21	21	3.1	
RA-32	0.1	05/12/1997	1430	4.16	0.23	2.18	0.71			0				57		
	0.1	06/09/1997	1205	86.2	3.08	38.7	23.7	0.12	6	2.9	9.02	0.24	0.16		289	
	0.1	06/23/1997	1245	25	2.46	31.4	<0.1	0.37	5.96	2.8	9.13	0.43	0.28		340	
	0.1	06/25/1997	1330	17.6	1.23	13	2.8	0.2	4.73	4	8.93	0.61	0.44		923	
	0.1	07/21/1997	1400	4.05	0.62	3.46	0.88	0.13	0.15	2	2.28	0.12	0.04		102	
	0.1	08/19/1997	1210	3.19	0.25	1.21	0.52	0.02	0.14	2.9	3.06	0.33	0.11		72	
	0.1	09/15/1997	1230	1.65	0.42	1.07		0.13	0.1	1.7	1.93	0.2	0.07		32	
	0.1	10/14/1997	1240	0.93	0.9	3.37		0.27	1.72	2.2	4.19	0.71	0.58		170	
	0.1	11/12/1997	1414	1.42	0.36	1.3	0.31	0.04	0.89	1	1.93	0.27	0.14		18	
	0.1	03/17/1998	0920	0.26	0.18	0.69	0.11	0.05	1.69	0.9	2.64	0.24	0.13		45	
RA-32	0.1	04/15/1998	1525	0.42	0.21	0.48	0.27	0.11	0.69	2.5	3.3	0.32	0.23		354	
	0.1	05/12/1998	1035	6.7	0.25	3	0.31	0.21	0.96	1.3	2.47	0.55	0.07		77	
	0.1	05/23/1998	0930	46.4	0.78	21.3	0.85	0.42	3.81	2.9	7.13	0.39	0.16		369	
	0.1	06/23/1998	1345	10.8	0.45	3.75	0.37	0.1	1.47	1.2	2.77	0.1	0.09		59	
	0.1	07/07/1998	1430	4.52	0.45	3.27	0.3	0.2	1.94	1.8	3.94	0.36	0.27		645	
	0.1	07/21/1998	1330	2.81	0.33	2.14	0.23	0.05	0.23	1.3	1.58	0.29	0.08		50	
	0.1	08/17/1998	1315	1.58	0.17	0.82	0.11	0.02	0.02	0.9	0.94	0.2	0.04		11	
	0.1	09/14/1998	1125	0.94	0.12	0.37	0.05	0.17	0.03	1.1	1.3	0.14	0.09			
	0.1	10/13/1998	1358	1.61	0.29	2.19	1.43	0.34	1.82	1.7	3.86	0.36	0.23			
	0.1	11/10/1998	0945	0.65	0.06	0.48	0.11	0.42	1.49	2.1	4.01	0.57	0.45	380	402	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-32	0.1	03/17/1999	1000	0.37	0.06	0.45	0.07	0.26	5.6	1.69	7.55	0.59	0.19	165	242	
	0.1	04/13/1999	0940	0.46	0.14	0.45	0.15	0.73	3.09	0.88	4.7	0.22	0.12	49	58	
	0.1	05/11/1999	0940	0.55	0.07	0.27	0.06	0.1	0.95	0.95	2	0.49	0.06	37	43	
	0.1	06/11/1999	0915	56.2	1.9	24.7	1.58	0.4	3.63	4.71	8.74	1.36	0.17	1053	1145	
	0.1	06/15/1999	0930	23.3	0.36	10.1	0.3	0.18	2.96	1.8	4.94	0.36	0.07	181	180	
	0.1	07/13/1999	1032	9.6	1.82	3.77	0.31	0.37	1.5	1.59	3.46	0.21	0.03	114	183	
	0.1	08/18/1999	1000	1.9	0.35	1.11	0.12	0.11	0.44	0.56	1.11	0.17	0.13	160	389	
	0.1	09/13/1999	0940	0.77	0.15	0.44	0.05				0			29	58	
	0.1	10/13/1999	1025	0.85	0.19	0.44	0.16	U	U	1.15	1.15	0.3	0.16	21	32	
	0.1	11/15/1999	1040	0.89	0.24	0.64	0.05	U	U	0.86	0.86	0.41	0.31	15	9.3	
RA-33	0.1	05/12/1997	1600	2.98	0.16	1.82	0.18	0.14	1.69	1	2.83	0.09	0.08			
	0.1	05/14/1997	0830								0				11	
	0.1	06/09/1997	1350	7.48	0.39	4.22	0.54	0.39	0.01	1.6	2	0.11	0.07		42	
	0.1	06/23/1997	1405	35.6	0.84	12	16.7	0.05	2.42	2.2	4.67	0.43	0.08		81	
	0.1	06/25/1997	1155	31.4	1.03	17.75	1.28	0.31	7.07	5.2	12.58	1	0.37		1856	
	0.1	07/21/1997	1500	4.08	1.71	2.4	0.96	0.46	0.09	2.9	3.45	0.16	0.06		250	
	0.1	08/19/1997	1320	5.7	1.32	3.5	<0.1	0.12	0.17	2	2.29	0.3	0.08		114	
	0.1	10/14/1997	1400						0.21	1.38	1.9	3.49	0.58	0.4		86
	0.1	11/12/1997	1530	0.65	0.56	0.24	0.18	0.04	0.83	0.9	1.77	0.25	0.17		58	
RA-33	0.1	03/17/1998	1120	<0.05	<0.05	<0.05	<0.04	0.09	1.3	1	2.39	0.12	0.12		50	
	0.1	04/15/1998	1345	0.21	0.05	0.04	0.08	0.11	0.67	3.5	4.28	0.53	0.18		1000	
	0.1	05/12/1998	1158	2	0.11	0.95	0.21	0.08	1.87	1.1	3.05	0.24	0.06		e38	
	0.1	05/23/1998	0850	93.6	0.86	24	1.62	0.5	6.02	3.5	10.02	0.51	0.15		404	
	0.1	06/23/1998	1515	11.1	0.35	2.79	2.15	0.09	1.26	1	2.35	0.16	0.1		63	
	0.1	07/07/1998	1525	4.42	0.24	1.28	0.63	0.31	2.26	1.1	3.67	0.65	0.28		176	
	0.1	07/21/1998	1430	2.36	0.22	1.26	0.77	0.26	0.16	0.6	1.02	0.13	0.06		22	
	0.1	08/17/1998	1410	1.24	0.1	0.39	0.27	0.04	0.03	0.8	0.87	0.18	0.03		22	
	0.1	09/14/1998	1215	0.56	0.05	0.13	0.08	0.16	0.14	1.4	1.7	0.22	0.07			
	0.1	10/13/1998	1450	0.29	<0.05	0.06	0.06	0.21	0.5	1.2	1.91	0.28	0.17			
RA-33	0.1	11/10/1998	1000	1.15	<0.05	0.11	0.15	0.19	1.68	2.2	4.07	0.58	0.34	570	692	
	0.1	03/17/1999	1020	0.31	0.05	<0.05	0.04	0.33	6.92	2.5	9.75	0.97	0.21	330	590	
	0.1	04/13/1999	1010	0.28	0.08	0.09	0.08	0.17	5.32	0.96	6.45	0.22	0.13	52	50	
	0.1	05/11/1999	1000	0.16	<0.05	0.14	<0.04	U	0.11	0.69	0.8	0.4	0.03	16	21	
	0.1	06/11/1999	0930	63.4	0.55	25.7	0.88	0.23	2.55	6.24	9.02	1.7	0.16	1660	1135	
	0.1	06/15/1999	0945	20.7	0.25	8.1	0.41	U	2.57	1.4	3.97	0.25	0.08	98	99	
	0.1	07/13/1999	1050	1.95	0.21	2.26	0.17	0.14	1.21	1.32	2.67	0.26	0.01	45	37	
	0.1	08/18/1999	1030	0.34	0.07	0.23	0.05	0.05	0.29	0.37	0.71	0.14	0.12	26	30	
	0.1	09/13/1999	1000	0.3	<0.05	0.15	<0.04	0.11	U	0.63	0.74	0.14	0.05	10	15	
	0.1	10/13/1999	1040	0.28	0.07	0.08	0.34				0			13	32	
	0.1	11/15/1999	1100	0.22	<0.05	0.22	<0.04	U	U	0.48	0.48	0.16	0.12	5	9.9	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-34	0.1	05/12/1997	1430					0.14	2.22	1.1	3.46	0.09	0.08		13	
	0.1	05/14/1997	0830	0.06	<0.05	<0.05	<0.04	0.08	0.01	1.7	1.79	0.16	0.03			
RA-34	0.1	03/18/1998	1540	<0.05	<0.05	0.1	<0.04	0.15	0.07	1.3	1.52	0.06	0.05		86	
	0.1	04/15/1998	1710	0.1	<0.05	<0.05	0.04	0.09	0.04	1.2	1.33	0.06	0.05		15	
	0.1	05/12/1998	1430	1.63	0.65	0.31	0.18	0.13	0.37	1.6	2.1	0.47	0.04		29	
	0.1	05/23/1998	1130	3.27	0.76	0.88	0.63	0.34	0.44	1.5	2.28	0.29	0.05		190	
	0.1	06/25/1998	0910	3.65	0.96	1.71	0.73	0.08	0.57	1.3	1.95	0.1	0.05		11	
	0.1	07/22/1998	1330	1	0.71	0.42	0.25	0.03	0.29	1.1	1.42	0.12	0.07		147	
	0.1	08/18/1998	1430	0.25	0.62	0.11	0.09	0.09	0.05	0.6	0.74	0.23	0.1		84	
	0.1	09/14/1998	1300	4.3	1.62	2.97	1.32	0.61	1.45	0.7	2.76	0.46	0.19			
	0.1	10/14/1998	1558	0.44	0.92	0.21	0.12	0.25	0.68	1.6	2.53	0.14	0.06			
RA-34	0.1	03/17/1999	1345	2.18	1.03	1.59	0.75	0.39	1.44	0.92	2.75	0.18	0.04	24	25	
	0.1	04/13/1999	1345	0.56	0.36	0.24	0.18	0.04	0.43	0.14	0.61	0.07	0.04	21	17	
	0.1	05/11/1999	1400	1.53	0.82	1.25	1.2	0.18	0.43	1.31	1.92	0.44	0.01	25	20	
	0.1	06/11/1999	1235	18.8	0.88	3.53	0.7	0.08	0.08	5.22	5.38	0.38	0.05	93	71	
	0.1	06/15/1999	1230	2.9	0.27	1.18	0.21	0.04	0.66	0.61	1.31	0.08	0.05	16	24	
	0.1	07/13/1999	1600	0.6	0.64	0.24	0.11	0.16	0.43	0.75	1.34	0.16	0.05	17	58	
	0.1	08/18/1999	1400	0.23	0.69	0.14	0.06	0.12	0.24	0.39	0.75	0.22	0.1	47	86	
	0.1	10/13/1999	1040					0.08	U	0.7	0.78	0.33	0.27			
RA-35	0.1	05/12/1997	0840	0.77	0.05	0.35	0.36	0.12	0.65	1.2	1.97	0.23	0.05		33	
	0.1	06/10/1997	1010	44.2	0.34	4.57	15.4	0.57	1.66	0.7	2.93	0.11	0.08		74	
	0.1	06/24/1997	1045	16.5	0.86	3.22	1.91	0.03	3.31	1.8	5.14	0.18	0.08		171	
	0.1	06/25/1997	1205	18.2	0.67	2.92	4.85	0.21	6.59	4.1	10.9	0.7	0.32		729	
	0.1	07/22/1997	0830	3.4	0.31	1.16	0.81	0.11	0.05	1.4	1.56	0.24	0.06		25	
	0.1	08/17/1997	1400	12.4	0.31	1.2	0.44	0.15	0.41	3.7	4.26	0.99	0.11		849	
	0.1	08/20/1997	0915	11.6	0.37	1.05	<0.1	0.12	0.51	2.4	3.03	0.28	0.06		162	
	0.1	09/15/1997	1505	2.02	0.1	0.21		<0.02	0.07	0.9	0.97	0.1	0.08		18	
	0.1	10/15/1997	1400	1.87	0.15	0.81		0.32	1.02	1.3	2.64	0.22	0.18		80	
	0.1	11/13/1997	0825	0.37	<0.05	0.12	0.17	0.22	0.75	0.6	1.57	0.18	0.11		23	
RA-35	0.1	03/17/1998	1520	<0.05	<0.05	0.06	0.05	0.22	0.79	2.5	3.51	0.24	0.19		979	
	0.1	04/15/1998	0945	0.29	<0.05	0.1	0.08	0.11	0.6	1.7	2.41	0.35	0.14		671	
	0.1	05/13/1998	1005	1.89	0.09	0.77	0.19	0.1	0.77	0.8	1.67	0.16	0.06		55	
	0.1	05/22/1998	1530	37.8	0.62	18.6	2.78	0.53	3.84	5.6	9.97	0.92	0.14		1160	
	0.1	06/24/1998	0815	7.9	0.36	1.61	0.38	0.1	1.04	0.9	2.04	0.12	0.06		357	
	0.1	07/21/1998	1621	1.32	0.12	0.54	0.15	0.08	0.03	0.8	0.91	0.11	0.07		11	
	0.1	08/17/1998	1630	1.66	0.4	1.09	0.11	0.05	0.04	0.7	0.79	0.17	0.05		21	
	0.1	09/14/1998	1710	0.79	0.06	0.22	0.05	0.07	0.06	1.2	1.33	0.22	0.07			
	0.1	10/14/1998	0802	0.31	<0.05	0.15	<0.04	0.14	1.13	1.2	2.47	0.25	0.17			
	0.1	11/10/1998	1100	0.33	<0.05	0.18	<0.04	0.18	1.38	1.4	2.96	0.53	0.3	150	266	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-35	0.1	03/17/1999	1120	0.17	<0.05	<0.05	<0.04	0.2	3.16	0.78	4.14	0.4	0.04	135	210	
	0.1	04/13/1999	1110	0.09	<0.05	0.05	<0.04	0.04	0.46	0.39	0.89	0.1	0.05	20	17	
	0.1	05/11/1999	1105	0.31	<0.05	0.15	<0.04	U	0.71	0.72	1.43	0.44	0.05	34	32	
	0.1	06/11/1999	1020	35.1	0.47	4.76	0.48	0.34	2.99	4.48	7.81	1.07	0.11	743	718	
	0.1	06/15/1999	1030	14.9	0.34	1.57	0.23	0.07	1.36	1.28	2.71	0.29	0.07	125	107	
	0.1	07/13/1999	1153	1.08	0.23	1.52	0.08	0.02	0.18	0.7	0.9	0.11	0.02	29	40	
	0.1	08/18/1999	1130	1.26	0.18	0.87	0.06	0.09	0.03	0.53	0.65	0.15	0.09	51	66	
	0.1	09/13/1999	1100	0.7	0.09	0.64	<0.04	0.06	0.05	0.83	0.94	0.12	0.03	47	51	
	0.1	10/13/1999	1150	0.57	0.1	0.36	0.11	0.03	U	0.79	0.82	0.3	0.18	36	32	
RA-36	0.1	05/13/1997	1015	0.69	<0.05	0.1	0.13	0.05	0.2	1.1	1.35	0.13	0.04	65		
	0.1	06/10/1997	0810	43.3	0.33	13.45	5.4	0.1	1.36	1	2.46	0.16	0.12	93		
	0.1	06/24/1997	0845	35.3	<0.1	20.4	<0.1	0.12	6.53	2.2	8.85	0.13	0.12	203		
	0.1	06/25/1997	1505	23	0.93	4.6	7.55	0.19	8.39	3.7	12.28	0.49	0.31	782		
	0.1	07/22/1997	0915	3.34	0.24	1.24	0.57	0.08	0.06	1.4	1.54	0.39	0.08	18		
	0.1	08/17/1997	1500	1.38	0.46	1.28	0.19	0.28	1.76	4.3	6.34	1.86	0.51	1187		
	0.1	08/20/1997	0822	1.48	0.19	1.77	0.12	0.34	0.8	2.5	3.64	0.28	0.14	188		
	0.1	09/15/1997	1350	0.67	0.16	0.24		0.15	0.07	1.2	1.42	0.2	0.07	24		
	0.1	10/15/1997	1530	1.11	0.1	1.31	0.08	0.9	1.23	1.2	3.33	0.24	0.15	56		
	0.1	11/13/1997	0949					0.13	0.67	0.5	1.3	0.12	0.1	42		
RA-36	0.1	03/17/1998	1325	0.08	<0.05	1.5	<0.04	0.23	0.83	2.4	3.46	0.31	0.19	1284		
	0.1	04/15/1998	1110	0.33	<0.05	0.09	0.1	0.07	0.79	1.7	2.56	0.33	0.17	520		
	0.1	05/13/1998	0845	4.79	0.16	5.3	0.22	0.09	0.5	0.7	1.29	0.11	0.05	31		
	0.1	05/22/1998	1620	82.8	<0.05	29.1	0.67	0.32	4.3	3.9	8.52	0.58	0.12	715		
	0.1	06/24/1998	0920	3.12	0.25	1.68	0.19	0.18	0.64	1.6	2.42	0.26	0.06	535		
	0.1	07/21/1998	1535	2.13	0.2	1.1	0.17	0.08	0.05	0.8	0.93	0.12	0.06	17		
	0.1	08/17/1998	1525	1.08	0.06	0.25	0.08	0.02	0.03	0.6	0.65	0.19	0.05	6		
	0.1	09/14/1998	1545	0.32	<0.05	0.07	<0.04	0.46	0.22	1.6	2.28	0.19	0.09			
	0.1	10/14/1998	0910	0.34	0.1	0.24	<0.04	0.19	1.21	1.4	2.8	0.23	0.14			
	0.1	11/10/1998	1040	0.8	0.07	0.36	0.12	0.13	1.63	1.5	3.26	0.47	0.28	250	290	
RA-36	0.1	03/17/1999	1100	0.24	<0.05	0.09	<0.04	0.29	5.7	1.29	7.28	0.45	0.09	175	263	
	0.1	04/13/1999	1040	0.2	0.05	0.07	<0.04	0.09	1.53	0.33	1.95	0.09	0.05	16	15	
	0.1	05/11/1999	1045	0.15	<0.05	0.07	<0.04	U	U	0.37	0.37	0.37	0.03	36	13	
	0.1	06/11/1999	1005	27.7	0.48	10.5	0.36	0.22	1.71	3.18	5.11	0.9	0.11	573	663	
	0.1	06/15/1999	1015	20.7	0.17	2.86	0.24	0.08	0.96	0.95	1.99	0.2	0.06	60	68	
	0.1	07/13/1999	1134	2.59	0.09	1.47	0.18	0.13	0.37	0.89	1.39	0.13	0.03	20	28	
	0.1	08/18/1999	1100	0.65	0.05	0.26	0.06	0.16	0.2	0.36	0.72	0.13	0.16	21	34	
	0.1	09/13/1999	1035	0.31	0.07	0.15	<0.04	0.06	U	0.45	0.51	0.1	0.06	6	19	
	0.1	10/13/1999	1125	0.25	0.05	0.18	0.08	U	U	0.64	0.64	0.4	0.37	5	6.9	
	0.1	11/15/1999	1140	0.08	0.05	0.12	<0.04	U	U	0.75	0.75	0.29	0.09	6.5	18	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-37	0.1	05/13/1997	1212	2.13	0.09	1.49	0.31	0.03	0.08	1	1.11	0.11	0.03		9	
	0.1	06/10/1997	1330	4.22	0.15	2.5	0.92	0.28	0.61	1	1.89	0.15	0.11		46	
	0.1	06/24/1997	1435	4.05	0.19	0.71	0.45	0.2	0.06	1.1	1.36	0.08	0.03		17	
	0.1	07/22/1997	1130	1.5	0.06	<0.1	<0.1	0.07	0.02	1.5	1.59	0.05	0.03		53	
	0.1	08/17/1997	1225	2.17	0.11	0.72	0.24	0.06	0.64	2.5	3.2	0.82	0.19		730	
	0.1	08/20/1997	1215	3.34	0.17	0.92	0.25	0.08	0.09	1.4	1.57	0.21	0.08		65	
	0.1	09/16/1997	0900	0.84	<0.05	0.11	0.08	0.09	0.07	0.9	1.06	0.12	0.05		15	
	0.1	10/16/1997	1015	1.71	<0.05	0.55		0.26	0.49	1.5	2.25	0.27	0.11		38	
	0.1	11/13/1997	1142	0.19	<0.05	<0.05	<0.04	0.11	0.18	0.4	0.69	0.08	0.06		21	
RA-37	0.1	03/18/1998	1700	0.05	<0.05	0.06	<0.04	<0.02	1.17	2	3.17	0.21	0.16		739	
	0.1	04/14/1998	1510	0.09	<0.05	<0.05	<0.04	0.08	0.38	1.2	1.66	0.15	0.11		164	
	0.1	05/13/1998	1245	3.22	<0.05	2.05	0.17	0.08	0.19	0.7	0.97	0.15	0.04		29	
	0.1	05/23/1998	0745					0.29	2.06	0.3	2.65	0.26	0.07		289	
	0.1	06/24/1998	1245	7.7	0.08	1.97	0.21	0.08	0.6	0.7	1.38	0.1	0.03		131	
	0.1	07/07/1998	1715	3.9	0.2	1.54	0.24	0.25	0.62	1.3	2.17	0.27	0.15		287	
	0.1	07/22/1998	0855	1.35	<0.05	0.53	0.11			0					37	
	0.1	08/18/1998	0905	0.65	<0.05	0.19	0.05	0.07	0.06	0.4	0.53	0.16	0.04		28	
	0.1	09/14/1998	1550	0.2	<0.05	0.16	<0.04	0.26	0.51	2.1	2.87	1.13	0.63			
	0.1	10/14/1998	1150					0.06	0.77	1.2	2.03	0.58	0.52			
	0.1	11/10/1998	1150	0.38	<0.05	0.1	<0.04	0.25	1.39	1.3	2.94	0.72	0.3	125	252	
RA-37	0.1	03/17/1999	1230	0.17	<0.05	<0.05	<0.04	0.26	3.52	1.42	5.2	0.73	0.08	235	510	
	0.1	04/13/1999	1220	0.07	<0.05	<0.05	<0.04	U	0.21	0.14	0.35	0.05	0.04	14	11	
	0.1	05/11/1999	1240	0.83	<0.05	0.28	0.07	U	0.84	0.59	1.43	0.45	0.05	9.5	31	
	0.1	06/11/1999	1125	30.1	0.28	4.5	0.33	0.19	1.05	2.42	3.66	0.55	0.09	275	425	
	0.1	06/15/1999	1130	11.6	0.11	2.44	0.21	0.04	0.41	0.72	1.17	0.15	0.09	27	34	
	0.1	07/13/1999	1310	1.34	0.06	0.78	0.08	0.03	U	0.75	0.78	0.13	0.01	16	29	
	0.1	08/18/1999	1230	1.19	<0.05	0.19	0.06	0.33	U	0.49	0.82	0.09	0.06	35	47	
	0.1	09/13/1999	1210	0.28	<0.05	0.1	<0.04	0.07	0.06	0.68	0.81	0.11	0.01	9	14	
	0.1	10/13/1999	1300	0.18	<0.05	0.09	0.07	0.12	U	0.8	0.92	0.08	0.01	22	26	
	0.1	11/15/1999	1310	0.12	<0.05	0.09	<0.04	U	U	1.45	1.45	0.36	0.04	6.5	3.9	
RA-38	0.1	05/13/1997	1610	1.73	0.06	1.33	0.54	0.1	0.23	1.1	1.43	0.2	0.03		16	
	0.1	06/10/1997	1455	6.42	0.15	5.75	2.21	0.28	0.8	0.8	1.88	0.13	0.09		32	
	0.1	06/24/1997	1545	8.75	0.46	3.29	1.67	0.24	0.19	1.6	2.03	0.09	0.05		141	
	0.1	08/17/1997	1110	2.21	0.15	1.41	4	0.09	1.3	2.4	3.79	1.24	0.48		370	
	0.1	08/20/1997	1410	1.47	0.09	0.85	0.18	0.14	0.33	1.1	1.57	0.24	0.08		22	
	0.1	10/15/1997	1200	0.93	0.07	0.74		0.32	0.8	1	2.12	0.26	0.24		33	
	0.1	11/13/1997	1455	0.47	<0.05	0.58	0.06	0.24	0.42	0.6	1.26	0.21	0.09		45	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-38	0.1	03/16/1998	1550	<0.05	<0.05	0.06	<0.04	0.11	0.86	0.7	1.67	0.17	0.05		29	
	0.1	04/14/1998	1335	0.09	<0.05	<0.05	0.05	0.11	0.52	1.1	1.73	0.12	0.09		145	
	0.1	05/13/1998	1420	9	0.22	2.38	0.2	0.13	0.52	0.5	1.15	0.07	0.03		22	
	0.1	05/22/1998	1645	20.4	0.36	4.76	0.52	0.36	3.02	3.7	7.08	0.54	0.14		648	
	0.1	06/24/1998	1545	3.84	0.16	1.65	0.21	0.14	0.7	1.2	2.04	0.19	0.04		115	
	0.1	07/22/1998	1035	1.23	<0.05	0.48	0.1	0.03	0.36	1.1	1.49	0.16	0.04		36	
	0.1	08/18/1998	1115	0.69	0.06	0.21	0.06	<0.02	0.03	0.7	0.73	0.16	0.03		26	
	0.1	09/14/1998	1426	0.21	<0.05	0.16	<0.04	0.5	2.17	1.2	3.87	0.7	0.3			
	0.1	10/14/1998	1335	0.35	<0.05	0.06	0.05	0.1	0.43	1	1.53	0.13	0.06			
	0.1	11/10/1998	1230	0.36	<0.05	0.11	<0.04	0.55	1.72	1.7	3.97	0.84	0.36	130	187	
RA-38	0.1	03/17/1999	1300	0.15	<0.05	<0.05	<0.04	0.16	3.87	1.31	5.34	0.55	0.09	245	356	
	0.1	04/13/1999	1305	0.07	<0.05	<0.05	<0.04	0.05	U	0.18	0.23	0.06	0.02	12	11	
	0.1	05/11/1999	1330	0.78	<0.05	0.33	0.05	0.04	0.13	1.06	1.23	0.55	0.03	80	212	
	0.1	06/11/1999	1200	27.4	0.32	4.65	0.45	0.24	0.92	2.4	3.56	0.56	0.1	295	439	
	0.1	06/15/1999	1215	2.54	0.08	1.42	0.14	U	0.53	0.72	1.25	0.13	0.06	51	122	
	0.1	07/13/1999	1355	0.92	0.06	0.49	0.09	0.02	U	0.76	0.78	0.09	U	19	11	
	0.1	08/18/1999	1330	3.94	<0.05	0.09	0.05	0.1	U	0.49	0.59	0.08	0.04	34	59	
	0.1	10/13/1999	1125					U	U	0.64	0.64	0.4	0.37			
	0.1	11/15/1999	1140					U	U	0.75	0.75	0.29	0.09			
RA-39	0.1	05/13/1997	1420	0.51	0.05	0.24	0.15	0.05	0.27	0.9	1.22	0.16	0.05		64	
	0.1	06/10/1997	1155	3.88	0.22	3.32	<0.1	0.1	1.42	0.6	2.12	0.24	0.14		76	
	0.1	06/24/1997	1245	16.7	0.58	2.99	6.75	0.12	2.31	1.8	4.23	0.21	0.15		327	
	0.1	07/22/1997	1030	1.93	0.18	0.64	0.71	0.19	0.16	1.4	1.75	0.1	0.06		132	
	0.1	08/17/1997	1615	1.99	0.18	1.07	0.53	0.14	2.08	2.9	5.12	0.7	0.24		712	
	0.1	08/20/1997	1140	2.36	0.24	1.17	0.82	0.11	0.32	1.8	2.23	0.23	0.08		63	
	0.1	09/15/1997	1615	0.53	0.11	0.1		0.02	0.07	1.8	1.89	0.19	0.11		28	
	0.1	10/16/1997	0825	1.52	0.14	1.07		0.27	0.72	1.7	2.69	0.34	0.13		76	
	0.1	11/13/1997	1319	0.61	0.08	0.29	0.12	0.16	0.49	0.8	1.45	0.17	0.15		14	
RA-39	0.1	03/09/1998	1630	0.19	<0.05	0.07	0.04	0.07	1.45	1.4	2.92	0.15	0.08		320	
	0.1	04/14/1998	1645	0.13	0.07	0.27	0.08	0.09	0.39	1.1	1.58	0.12	0.08		144	
	0.1	05/13/1998	1130	0.54	0.06	0.28	0.08	0.1	0.46	0.8	1.36	0.22	0.07		47	
	0.1	05/22/1998	1725	37.6	0.66	4.89	9.4	0.75	3.42	5.7	9.87	0.81	0.14		1170	
	0.1	06/25/1998	0810	1.65	0.11	0.75	0.11	0.16	0.73	4	4.89	0.89	0.15		1810	
	0.1	07/08/1998	0740	2.67	0.2	1.41	0.27	0.25	0.74	0.9	1.89	0.41	0.14		157	
	0.1	07/22/1998	0747	0.81	0.11	0.18	0.12	0.13	0.12	3.9	4.15	0.82	0.09		1000	
	0.1	08/18/1998	0755	0.35	<0.05	0.08	0.05	0.09	0.12	1	1.21	0.25	0.07		48	
	0.1	09/14/1998	1750	0.17	<0.05	0.12	<0.04	0.12	0.47	1	1.59	0.22	0.17			
	0.1	10/14/1998	1100	0.54	<0.05	<0.05	0.07	0.04	0.39	0.8	1.23	0.12	0.07			
	0.1	11/10/1998	1130	0.21	<0.05	0.46	0.15	0.21	0.9	1.4	2.51	0.43	0.28	230	294	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-39	0.1	03/17/1999	1200	0.25	<0.05	<0.05	<0.04	0.11	1.79	1.36	3.26	0.52	0.06	175	330	
	0.1	04/13/1999	1155	0.15	<0.05	0.12	<0.04	0.38	0.23	0.39	1	0.1	0.06	16	24	
	0.1	05/11/1999	1200	0.26	<0.05	0.14	<0.04	U	0.06	0.92	0.98	0.4	0.03	15	18	
	0.1	06/11/1999	1100	17.6	0.19	2.04	0.28	0.24	0.86	2.61	3.71	0.57	0.08	316	452	
	0.1	06/15/1999	1100	4.51	0.06	1.08	0.13	0.08	0.42	0.9	1.4	0.22	0.06	64	87	
	0.1	07/13/1999	1241	0.63	0.06	0.26	0.07	0.14	0.04	0.87	1.05	0.13	0.03	34	47	
	0.1	08/18/1999	1200	0.19	0.09	0.98	0.08	0.17	0.14	0.47	0.78	0.17	0.11	67	120	
	0.1	09/13/1999	1135	0.11	<0.05	<0.05	<0.04	0.04	0.04	1.87	1.95	0.28	0.05	49	76	
	0.1	10/13/1999	1230	0.1	<0.05	0.09	0.07	0.05	U	1.98	2.03	0.54	0.27	34	44	
	0.1	11/15/1999	1240	0.11	<0.05	0.13	<0.04	U	U	1.45	1.45	0.36	0.25	25	23	
RA-40	0.1	05/14/1997	1045	1.04	<0.05	0.62	0.12	0.12	0.34	1	1.46	0.14	0.05	14		
	0.1	06/11/1997	0955	0.88	<0.05	0.3	<0.1	0.17	0.17	0.8	1.14	0.1	0.07	18		
	0.1	06/25/1997	0920	1.93	0.26	1.12	0.48				0			319		
	0.1	07/21/1997	1050	0.7	<0.1	<0.1	0.7	0.21	1.03	3.7	4.94	0.28	0.26	384		
	0.1	08/17/1997	1730	2.24	0.23	1.35	3	0.1	0.71	2.8	3.61	0.74	0.19	334		
	0.1	08/21/1997	0950	1.42	0.09	0.67	0.31	0.03	0.29	1.7	2.02	0.41	0.16	117		
	0.1	09/15/1997	0910	0.34	<0.05	0.08		0.37	0.33	1.9	2.6	0.31	0.09	49		
	0.1	10/15/1997	0945	0.82	0.07	0.5	0.17	0.27	0.67	1.5	2.44	0.51	0.18	41		
	0.1	11/12/1997	1015	0.25	0.06	0.1	<0.04	0.18	0.69	0.5	1.37	0.2	0.04	14		
RA-40	0.1	03/16/1998	1400	<0.05	<0.05	0.07	<0.04	<0.02	0.59	1.3	1.89	0.13	0.07	46		
	0.1	04/14/1998	1130	0.2	<0.05	<0.05	0.08				0			176		
	0.1	05/14/1998	0930	0.99	<0.05	0.91	0.82	0.08	0.22	0.7	1	0.05	0.04	24		
	0.1	05/22/1998	1235	39.9	0.57	4.1	14.7	0.44	3.68	4.6	8.72	0.53	0.11	804		
	0.1	06/25/1998	1050	2.73	0.17	0.65	1.56	0.07	0.77	0.8	1.64	0.12	0.09	38		
	0.1	07/22/1998	1130	1	<0.05	0.22	0.3	0.1	0.3	1.2	1.6	0.09	0.05	41		
	0.1	08/18/1998	1215	2.49	<0.05	0.15	0.44	0.07	0.14	0.8	1.01	0.17	0.04	21		
	0.1	09/14/1998	1134	0.77	0.11	0.06	0.1	0.37	0.4	0.9	1.67	0.46	0.26			
	0.1	10/14/1998	1440	0.65	<0.05	0.06	0.2	0.12	0.2	1.1	1.42	0.16	0.1			
RA-40	0.1	11/10/1998	1330	0.27	<0.05	<0.05	0.09	0.21	0.85	1.3	2.36	0.28	0.2	95	108	
	0.1	03/17/1999	1425	0.12	<0.05	<0.05	<0.04	0.03	3.52	2.59	6.14	1.1	0.1	115	165	
	0.1	04/13/1999	1420	0.08	<0.05	0.01	<0.04	0.4	U	0.51	0.91	0.15	0.07	12	9	
	0.1	05/11/1999	1450	0.22	<0.05	<0.05	<0.04	0.09	0.78	1.01	1.88	0.43	0.05	26	19	
	0.1	06/11/1999	1325	34.1	0.3	19.4	0.43	0.15	1.91	2.8	4.86	0.66	0.1	434	396	
	0.1	06/15/1999	1330	11.3	0.08	3.65	0.18	1.79	0.68	2.92	5.39	0.45	0.29	69	74	
	0.1	07/13/1999	1635	1.44	0.08	1.42	0.13	0.08	0.06	1.25	1.39	0.18	0.03	65	233	
	0.1	08/18/1999	1500	1.3	<0.05	0.12	0.09	0.26	U	1.33	1.59	0.29	0.1	156	433	
	0.1	09/13/1999	1430	0.21	<0.05	0.13	<0.04	U	U	1.44	1.44	0.23	0.03	47	75	
	0.1	10/13/1999	1520	0.07	<0.05	0.07	<0.04	0.02	0.01	1.5	1.53	0.26	0.07	143	325	
	0.1	11/15/1999	1445	0.06	<0.05	0.12	<0.04	U	0.02	0.86	0.88	0.21	0.1	30	28	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-41	0.1	05/12/1997	1120	0.3	<0.1	<0.1	<0.1	0.17	0.46	1	1.63	0.05	0.04			
	0.1	06/09/1997	1640	6.24	0.82	4.63	7.9	0.21	1.13	2.6	3.94	0.2	0.15	259		
	0.1	06/23/1997	1620	20.6	0.84	3.75	4.2	0.02	0.63	1.4	2.05	0.12	0.06	75		
	0.1	07/21/1997	1240	2.87	0.33	1.71	0.69	0.16	0.14	1.9	2.2	0.13	0.05	202		
	0.1	08/19/1997	1050	1.1	0.11	0.31	0.23	0.16	0.6	1.8	2.56	0.34	0.15	160		
	0.1	09/15/1997	1120	<0.05	<0.05	<0.05		0.06	0.09	0.5	0.65	0.37	0.05	15		
	0.1	10/14/1997	1610	0.63	0.08	0.7		0.22	1.1	2.4	3.72	0.46	0.3	164		
	0.1	11/12/1997	1230	0.18	<0.05	0.05	<0.04	0.04	0.34	0.5	0.88	0.19	0.04	17		
RA-41	0.1	03/16/1998	1150	0.05	<0.05	0.06	<0.04	0.7	0.79	0.8	2.29	0.24	0.08	60		
	0.1	04/16/1998	1015	0.14	0.08	0.07	0.06	0.07	0.46	1	1.53	0.13	0.09	266		
	0.1	05/14/1998	0725	0.7	0.07	0.13	0.1	0.11	0.29	0.6	1	0.07	0.04	31		
	0.1	05/23/1998	1025	30.1	0.54	12.9	0.6	0.45	2.66	3.3	6.41	0.34	0.08	531		
	0.1	06/23/1998	1150	10.1	0.23	2.11	1.39	0.09	0.85	0.7	1.64	0.1	0.06	40		
	0.1	07/08/1998	0910	4.27	0.21	1.79	0.45	0.35	1.57	1	2.92	0.36	0.15	264		
	0.1	07/21/1998	1130	1.68	0.1	0.65	0.31	0.08	0.23	0.4	0.71	0.11	0.06	13		
	0.1	08/17/1998	1100	0.85	<0.05	0.17	0.11	<0.02	0.02	0.4	0.42	0.18	0.04	8		
	0.1	09/15/1998	0850	0.26	<0.05	0.08	<0.04	0.1	0.19	1.1	1.39	0.2	0.09			
	0.1	10/13/1998	1130	0.48	0.05	0.12	0.06	0.21	0.75	1	1.96	0.21	0.11			
	0.1	11/10/1998	0845	0.24	<0.05	0.05	<0.04	3.03	0.88	2.1	6.01	0.46	0.2	575	802	
RA-41	0.1	03/17/1999	0840	0.15	<0.05	0.05	<0.04	0.03	3.52	2.59	6.14	1.1	0.1	510	952	
	0.1	04/13/1999	0830	0.08	<0.05	<0.05	<0.04	0.09	0.96	0.46	1.51	0.11	0.06	33	48	
	0.1	05/11/1999	0820	0.07	<0.05	0.07	<0.04	U	U	0.67	0.67	0.38	0.03	23	30	
	0.1	06/11/1999	0805	41.5	0.22	4.63	0.36	0.36	1.91	6.35	8.62	2.19	0.08	2204	2508	
	0.1	06/15/1999	0830	17.1	0.13	3.27	0.21	0.08	0.92	1.13	2.13	0.22	0.06	81	93	
	0.1	07/13/1999	0912	1.72	0.09	1.03	0.09	0.14	0.38	0.8	1.32	0.11	0.02	35	55	
	0.1	08/18/1999	0900	1.68	0.06	0.4	0.11	0.29	0.51	1.03	1.83	0.23	0.08	69	90	
	0.1	09/13/1999	0830	1.17	<0.05	0.33	0.07	U	U	0.96	0.96	0.19	0.02	44	68	
	0.1	10/13/1999	0910	0.76	<0.05	0.1	0.12	0.02	U	1	1.02	0.16	0.03	46	78	
	0.1	11/15/1999	0910	0.47	0.05	0.21	<0.04	U	U	0.95	0.95	0.2	0.07	42	62	
RA-42	0.1	06/24/1998	1050	8.7	0.18	1.67	0.7				0			48		
	0.1	07/07/1998	1325	3.94	0.24	1.75	0.37	0.22	1.52	1.6	3.34	0.38	0.22	499		
	0.1	07/21/1998	1215	1.26	0.05	0.54	0.14	0.04	0.03	0.6	0.67	0.19	0.05	19		
	0.1	08/17/1998	1210	0.36	<0.05	0.13	0.07	0.07	0.09	0.8	0.96	0.25	0.05	87		
	0.1	09/14/1998	1355	0.22	<0.05	0.1	<0.04	1.06	0.22	2.4	3.68	0.22	0.12			
	0.1	10/13/1998	1245	0.21	<0.05	<0.05	<0.04	0.5	0.67	2	3.17	0.24	0.1			
	0.1	11/10/1998	0915	0.3	<0.05	0.11	0.05	0.34	1.2	2	3.54	0.52	0.38	400	439	

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T ORTH P mg/L	Turb NTU	TSS mg/L	Chlor ug/L
RA-42	0.1	03/17/1999	0930	0.15	<0.05	<0.05	<0.04	0.1	2.81	1.9	4.81	0.9	0.07	230	325	
	0.1	04/13/1999	0910	0.1	<0.05	<0.05	<0.04	0.08	1	0.52	1.6	0.17	0.07	39	91	
	0.1	05/11/1999	0900	0.05	<0.05	<0.05	<0.04	U	U	0.55	0.55	0.38	0.03	19	22	
	0.1	06/11/1999	0845	53.4	0.48	20.1	0.56	0.26	3.02	4.64	7.92	1.17	0.17	821	782	
	0.1	06/15/1999	0900	35.8	0.27	10.3	0.32	0.16	1.16	1.71	3.03	0.27	0.06	110	112	
	0.1	07/13/1999	0952	2.69	0.11	1.32	0.16	0.06	1.15	2.02	3.23	0.22	0.02	35	95	
	0.1	08/18/1999	0930	1.01	0.11	0.47	0.1	1.27	0.06	3.98	5.31	0.24	0.08	134	310	
	0.1	09/13/1999	0910					0.08	0.06	1.78	1.92	0.24	0.02	215	457	
	0.1	10/13/1999	0940	0.6	0.09	0.14	0.12	0.14	0.01	1.8	1.95	0.27	0.05	43	41	
RA-43	0.1	05/10/1999	1530	0.79	0.11	0.11	0.07	0.47	4.18	0.75	5.4	0.1	0.07	15	15	1.6
	0.1	06/11/1999	1300	48.5	0.53	19.4	1.23	0.33	4.29	2.07	6.69	0.32	0.11	159	113	
	0.1	06/15/1999	1300	1.8	0.3	4.34	0.49	0.08	4.56	1	5.64	0.2	0.12	51	53	
	0.1	07/13/1999	1440	2.44	0.23	1.18	0.21	0.06	0.15	1.2	1.41	0.15	0.02	23	32	26.9
	0.1	08/18/1999	1430	1.05	0.1	0.48	0.1	0.17	1.94	1.68	3.79	0.25	0.09	33	41	34.7
	0.1	09/13/1999	1345	0.97	0.12	0.45	0.1	0.1	0.15	1.04	1.29	0.15	0.04	11	16	0.9

Appendix , Table 7. Rathbun Lake 1999 Profile Data

Station	Date	Depth	Time	Temp	D.O.	Spec. Cond.	pH	Orp.
	mm/dd/yy	m	hhmm	°C	mg/L	u ohms		mV
RA-3	04/14/1999	0.1	0815	9.8	9.8			
		1	0816	9.8	9.8			
		2	0817	9.8	9.8			
		3	0818	9.8	9.8			
		4	0819	9.8	9.7			
		5	0820	9.8	9.6			
		6	0821	9.8	9.6			
		7	0822	9.8	9.6			
		8	0823	9.8	9.6			
		9	0824	9.8	9.6			
		10	0825	9.8	9.4			
		11	0826	9.8	9.4			
		12	0827	9.8	9.3			
		13	0828	9.8	9.2			
RA-3	05/11/1999	0.1	0745	13.7	9.4	281	7.8	316
		1	0746	13.6	9.3	282	7.8	318
		2	0747	13.5	9.3	281	7.8	321
		3	0748	13.4	9.2	281	7.8	323
		4	0749	13.4	9.2	281	7.8	325
		5	0750	13.3	9.2	281	7.8	327
		6	0751	13.3	9.1	281	7.7	328
		7	0752	13.3	9.1	281	7.7	329
		8	0753	13.2	9.1	281	7.7	330
		9	0754	13.2	9.1	281	7.7	331
		10	0755	13.2	9.1	281	7.7	332
		11	0756	13.1	9	281	7.7	333
		12	0757	13.1	9	281	7.7	333
		13	0758	13.1	9	281	7.7	334
		14	0759	13.1	9.1	281	7.7	335
		14.9	0800	13	9	281	7.7	337
RA-3	06/15/1999	0.1	0745	22.8	8.1	258	8	237
		1	0746	22.8	8	259	8.1	258
		2	0747	22.8	8	259	8	254
		3	0748	22.8	7.9	259	8	258
		4	0749	22.8	7.9	259	8.1	261
		5	0750	22.7	7.9	259	8.1	264
		6	0751	22.7	7.9	259	8.1	266
		7	0752	22.6	7.9	259	8.1	268
		8	0753	21.9	7.2	260	7.9	274
		9	0754	19.3	5.2	268	7.4	295
		10	0755	18.3	4.8	268	7.3	302
		11	0756	17.9	4.6	268	7.3	305
		12	0757	17.7	4.4	269	7.3	307
		13	0758	17.7	4.4	269	7.3	309
		14	0759	17.3	3.6	271	7.2	312
		15	0800	17.1	3.2	272	7.2	314
		16	0801	16.9	2.7	273	7.1	315

Station	Date	Depth	Time	Temp	D.O.	Spec. Cond.	pH	Orp.
		mm/dd/yy	m	hhmm	°C	mg/L	u ohms	mV
RA-3	07/13/1999	0.1	0730	24.4	6.7	252	8	207
		1	0731	24.4	6.4	253	8	212
		2	0732	24.5	6.5	252	8	216
		3	0733	24.5	6.5	252	8	218
		4	0734	24.5	6.4	253	8	221
		5	0735	24.4	6.5	253	8	224
		6	0736	24.3	6.4	253	8	227
		7	0737	24.2	6.6	254	8.1	227
		8	0738	24.1	6.4	254	8.1	229
		9	0739	23.9	5.7	255	7.8	240
		10	0740	23	3.3	257	7.4	260
		11	0741	21.8	2.3	260	7.2	268
		12	0742	19.3	0.6	268	7.1	276
		13	0743	18.3	0.2	274	7	278
		14	0744	18.1	0.2	278	7	275
		15	0745	17.6	0.1	283	7	264
RA-3	08/18/1999	0.1	0830	24.5	6.3	245	7.6	291
		1	0831	24.5	6.1	253	7.6	296
		2	0832	24.5	6.1	253	7.6	298
		3	0833	24.4	5.9	255	7.5	301
		4	0834	24.2	5.6	255	7.5	303
		5	0835	24	5.2	255	7.4	305
		6	0836	23.9	5	256	7.4	307
		7	0837	23.8	4.7	257	7.4	309
		8	0838	23.7	4.3	257	7.3	312
		9	0839	23.7	4.2	257	7.3	313
		10	0840	23.6	3.9	258	7.3	315
		11	0841	23.6	3.7	257	7.3	316
		12	0842	23.5	3.3	258	7.2	318
		13	0843	23.5	3	259	7.2	319
		14	0844	23.1	1.4	262	7.1	322
RA-3	09/14/1999	0.1	0800	21.4	7.9		7.9	335
		1	0801	21.4	7.8		7.9	342
		2	0802	21.4	7.8		7.8	372
		3	0803	21.4	7.6		7.9	374
		4	0804	21.3	7.5		7.9	376
		5	0805	21.3	7.5		7.9	378
		6	0806	21.3	7.5		7.9	379
		7	0807	21.3	7.5		7.9	380
		8	0808	21.2	7.6		7.9	382
		9	0809	21.1	7.6		7.9	383
		10	0810	21.1	7.6		7.9	384
		11	0811	21	7.6		7.9	386
		12	0812	21	7.6		7.9	387

Station	Date	Depth	Time	Temp	D.O.	Spec. Cond.	pH	Orp.
		mm/dd/yy	m	hhmm	°C	mg/L	u ohms	mV
RA-3	10/13/1999	0.1	0900	15.2	8.3	262	8.8	194
		1	0901	15.2	8.3	262	8.8	195
		2	0902	15.2	8.3	262	8.8	195
		3	0903	15.2	8.3	262	8.8	195
		4	0904	15.2	8.3	262	8.8	195
		5	0905	15.3	8.3	262	8.8	197
		6	0906	15.3	8.3	262	8.8	197
		7	0907	15.3	8.3	262	8.8	197
		8	0908	15.3	8.3	262	8.8	197
		9	0909	15.3	8.3	262	8.8	197
		10	0910	15.2	8.3	262	8.8	198
		11	0911	15.2	8.3	262	8.8	198
		12	0912	15.2	8.3	262	8.8	198
		13	0913	15.2	8.3	262	8.8	198
		13.5	0914	15.1	8.3	263	8.8	199
RA-7	04/14/1999	0.1	1000	11.5	9.6			
		1	1001	11.5	9.5			
		2	1002	11.5	9.5			
		3	1003	11.5	9.5			
		4	1004	11.5	9.5			
		5	1005	11.5	9.5			
		6	1006	11.4	9.1			
		7	1007	11.3	9			
RA-7	05/12/1999	0.1	0815	16.1	8.7	248	7.5	349
		1	0816	16.1	8.6	248	7.5	351
		2	0817	16.1	8.5	248	7.5	352
		3	0818	16.1	8.5	249	7.6	358
		4	0819	16.1	8.4	249	7.6	356
		5	0820	16.1	8.5	249	7.6	357
		6	0821	16	8.4	249	7.6	360
		7	0822	16	8.4	249	7.5	361
		8	0823	16	8.4	249	7.6	361
RA-7	06/15/1999	0.1	0945	23	7.1	234	7.7	309
		1	0946	23	7	234	7.7	309
		2	0947	23	6.9	234	7.7	309
		3	0948	23	6.9	234	7.7	310
		4	0949	22.4	6.8	235	7.6	312
		5	0950	21.9	6.6	240	7.6	315
		6	0951	20.8	4.9	253	7.3	324
		7	0952	20.3	4.4	257	7.3	328
		8	0953	20.3	4.2	258	7.3	329
		9	0954	20	3.6	259	7.2	331
		10	0955	19.9	3.5	259	7.2	332

Station	Date mm/dd/yy	Depth m	Time hhmm	Temp °C	D.O. mg/L	Spec. Cond. u ohms	pH	Orp. mV
RA-7	07/13/1999	0.1	1200	26.3	9	241	8.6	263
		1	1201	25.9	7.8	242	8.3	270
		2	1202	25	7	241	8.1	278
		3	1203	24.9	6.6	241	7.8	286
		4	1204	24.8	6.1	241	7.7	290
		5	1205	24.6	5.3	242	7.6	296
		6	1206	24.5	5.3	243	7.6	297
		7	1207	24.5	5.3	242	7.6	298
		8	1208	24.3	5.7	242	7.6	298
		9	1209	23.7	1.6	247	7.4	303
RA-7	08/18/1999	0.1	1130	25.8	9.6	248	8.6	300
		1	1131	25.4	7.8	250	8.2	308
		2	1132	24.5	6.3	251	7.7	318
		3	1133	23.7	4.5	252	7.4	327
		4	1134	23.6	4.3	252	7.4	329
		5	1135	23.6	4.1	252	7.3	331
		6	1136	23.5	4	252	7.3	332
		7	1137	23.5	4	252	7.3	332
RA-7	09/14/1999	0.1	1330	20.5	8		7.9	355
		1	1331	20.5	7.9		7.8	362
		2	1332	20.5	7.8		7.8	362
		3	1333	20.5	7.8		7.9	364
		4	1334	20.5	7.8		7.9	366
		5	1335	20.4	7.8		7.9	368
		6	1336	20.4	7.7		7.9	370
		7	1337	20.4	7.7		7.9	371
RA-7	10/14/1999	0.1	1000	14.9	9.4	260	9.3	198
		1	1001	14.9	9.4	260	9.3	198
		2	1002	14.9	9.4	260	9.3	198
		3	1003	14.9	9.3	261	9.3	198
		4	1004	14.9	9.3	261	9.3	198
		5	1005	14.8	9.2	261	9.3	199
		6	1006	14.8	9.2	261	9.3	200
		7	1007	14.7	9.2	261	9.3	201
RA-8	04/14/1999	0.1	1030	12.6	9.2			
		1	1031	12.5	9.1			
		2	1032	12.5	8.9			
		3	1033	12.3	8.5			
		4	1034	11.8	8.1			
		5	1035	11.8	8			

Station	Date	Depth	Time	Temp	D.O.	Spec. Cond.	pH	Orp.
	mm/dd/yy	m	hhmm	°C	mg/L	u ohms		mV
RA-8	05/12/1999	0.1	0900	17.2	8.5	276	7.6	353
		1	0901	17.2	8.4	277	7.6	354
		2	0902	17.1	8.3	277	7.6	355
		3	0903	17	8.2	278	7.6	356
		4	0904	16.5	7.8	271	7.5	358
		5	0905	15.6	7.3	268	7.4	362
		6	0906	15.7	7.5	239	7.4	363
RA-8	06/15/1999	0.1	1045	23.3	3.6	204	7.1	350
		1	1046	23.3	3.6	206	7.1	347
		2	1047	23.3	3.5	206	7.1	347
		3	1048	23.3	3.4	206	7.1	347
		4	1049	23.3	3.4	206	7.1	346
		5	1050	23.2	3.3	206	7.1	346
		6	1051	23	1.8	209	7	348
RA-8	07/13/1999	0.1	1330	26.4	7.4	251	8	295
		1	1331	26.3	7.3	251	8	298
		2	1332	25.9	6.8	251	7.8	302
		3	1333	25.4	5.8	250	7.7	308
		4	1334	24.7	4.5	249	7.5	315
		5	1335	24.5	3.5	250	7.4	318
		6	1336	24.4	2.9	251	7.3	320
RA-8	08/18/1999	0.1	1230	26.3	7.9	275	8	324
		1	1231	26.2	7.8	278	8	324
		2	1232	26	7.5	281	8	327
		3	1233	25.4	6.1	288	7.7	333
		4	1234	24.5	3.5	300	7.3	341
		5	1235	24.2	2.6	301	7.2	344
RA-8	09/14/1999	0.1	1430	20.4	8.4		7.9	371
		1	1431	20.4	8.2		8.2	373
		2	1432	20.3	8		7.9	379
		3	1433	19.9	6.6		7.7	387
		4	1434	19.7	6.7		7.7	389
		4.5	1435	19.7	6.5		7.7	390
RA-8	10/14/1999	0.1	0900	15.1	9.2	296	9.4	187
		1	0901	15.1	9.2	297	9.4	187
		2	0902	15.1	9.1	297	9.4	187
		3	0903	15.1	9.1	298	9.4	188
		4	0904	15	9.1	298	9.4	188

Station	Date	Depth	Time	Temp	D.O.	Spec. Cond.	pH	Orp.
	mm/dd/yy	m	hhmm	°C	mg/L	u ohms		mV
RA-25	04/14/1999	0.1	0915	11.4	10.6			
		1	0916	11.4	10.6			
		2	0917	11.4	10.6			
		3	0918	11.4	10.6			
		4	0919	11.4	10.6			
		5	0920	11.4	10.6			
		6	0921	11.4	10.6			
		7	0922	11.4	10.5			
		8	0923	11.3	10.5			
RA-25	05/11/1999	0.1	0845	15.4	9.9	277	7.9	342
		1	0846	15.3	9.6	278	7.9	343
		2	0847	14.9	9.4	280	7.8	345
		3	0848	14.7	9.5	280	7.9	345
		4	0849	14.5	9.4	280	7.9	346
		5	0850	14.5	9.4	281	7.9	347
		6	0851	14.3	9.3	281	7.8	348
		7	0852	14.1	9.1	281	7.8	349
		8	0853	14	9.1	281	7.8	349
		9	0854	13.8	8.6	282	7.7	352
RA-25	06/15/1999	10	0855	13.4	7.5	285	7.6	356
		0.1	0845	22.1	7.9	260	7.9	287
		1	0846	22.1	7.9	260	8	289
		2	0847	22.2	7.8	260	7.9	291
		3	0848	22.2	7.7	260	7.9	293
		4	0849	22.2	7.7	260	7.9	295
		5	0850	22.1	7.5	261	7.8	297
		6	0851	21.8	7.1	260	7.8	301
		7	0852	21.8	7	260	7.7	303
		8	0853	21.8	6.8	261	7.7	306
		9	0854	21.5	6.3	262	7.6	311
RA-25	07/13/1999	10	0855	20.8	5.2	264	7.4	318
		11	0856	20.4	4.3	265	7.3	320
		0.1	0930	26.4	10.4	247	8.9	194
		1	0931	26.3	10.5	248	8.8	200
		2	0932	26.1	10.2	249	8.8	205
		3	0933	26	10.1	249	8.8	207
		4	0934	25.7	8	252	8.5	223
		5	0935	25.2	5.4	256	7.8	250
		6	0936	25.1	4.8	256	7.7	256
		7	0937	25	4	257	8	263
		8	0938	24.6	26	260	7.4	272
		9	0939	23.1	0.6	263	7.2	279
		10	0940	22	0.5	267	7.2	282

Station	Date	Depth	Time	Temp	D.O.	Spec. Cond.	pH	Orp.
	mm/dd/yy	m	hhmm	°C	mg/L	u ohms		mV
RA-25	08/18/1999	0.1	0930	25.1	8.2	252	8.2	287
		1	0931	25.1	8	253	8.2	289
		2	0932	24.8	6.7	255	7.8	299
		3	0933	24.6	5.9	256	7.6	304
		4	0934	24.5	5.4	257	7.5	307
		5	0935	24.4	4.9	257	7.4	310
		6	0936	24.4	4.7	257	7.4	312
		7	0937	24.2	4.4	258	7.4	313
		8	0938	23.8	3	260	7.3	317
RA-25	09/14/1999	0.1	1030	21.5	7.3		7.7	361
		1	1031	21.4	7.1		7.7	366
		2	1032	21.4	7		7.7	370
		3	1033	21.3	6.8		7.7	374
		4	1034	21.3	6.8		7.7	376
		5	1035	21.3	6.7		7.7	379
		6	1036	21.3	6.7		7.7	382
		7	1037	21.2	6.7		7.7	383
		7.5	1038	21.1	6.7		7.7	372
RA-25	10/13/1999	0.1	1100	16.4	9.9	259	9.3	268
		1	1101	16.4	9.9	259	9.3	263
		2	1102	16.4	9.9	259	9.3	260
		3	1103	16.4	9.9	259	9.4	258
		4	1104	16.4	9.9	259	9.4	258
		5	1105	16.4	9.9	259	9.4	257
		6	1106	16.4	9.9	260	9.4	255
		7	1107	16.4	9.9	260	9.4	252
		7.5	1108	16.4	9.9	260	9.4	249
RA-28	04/14/1999	0.1	1130	10	11.1			
	05/11/1999	0.1	1300	13.7	10.6	281	7.8	405
	06/15/1999	0.1	1200	19.2	9.3	266	7.6	293
	07/13/1999	0.1	0720	22.5	836	260	7	276
	08/19/1999	0.1	0715	24.6	7.8	255	7.7	293
	09/13/1999	0.1	1245	22	8.8	251	8.1	321
	10/14/1999	0.1	1200	15.3	9.7	257	9.2	245

Appendix Table 8. Rathbun Lake 1999 Water Quality Data (Part 1)

Station	Depth m	Date mm/dd/yy	Time hhmm	Atraz ug/L	Alach ug/L	Metol ug/L	Cyana ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	TOP mg/L	Turb NTU	TSS mg/L	Chlor ug/L	Secchi m	Phot m
RA-3	0.1	4/14/99	0815	0.66	0.05	0.34	0.09	U	0.46	0.39	0.85	0.06	0.03	18	15	0.46	1.49	
	0.1	5/11/99	0745	0.52	<0.05	0.3	0.08	0.19	0.81	0.5	1.5	0.04	0.02	20	13	4.2	0.55	1.31
	0.1	6/15/99	0745	1.31	0.08	1.02	0.11	U	1.23	0.62	1.85	0.06	0.03	24	9.3	6.2	0.49	1.28
	0.1	7/13/99	0730	0.79	0.09	1.7	0.06	U	1.01	0.68	1.69	0.07	U	17	8.1	2.4	0.76	1.68
	0.1	8/18/99	0830	0.85	0.09	2.02	0.07	U	0.96	0.39	1.35	0.05	0.03	12	9	6	0.88	2.04
	0.1	9/14/99	0800	0.91	0.06	2.12	0.09	U	0.68	0.42	1.1	0.01	0.01	11	14	4	0.82	1.9
	0.1	10/13/99	0900	0.97	0.11	1.37	0.22	0.07	U	0.32	0.39	0.04	0.01	17	17	5.6	0.61	1.37
RA-3	7	5/11/99	0752	0.6	<0.05	0.29	0.08	0.24	0.78	0.39	1.41	0.06	0.04	24	20			
	10	7/13/99	0740	0.81	0.11	1.73	0.06	U	1.04	0.7	1.74	0.08	U	25	24			
	6	9/14/99	0806	0.91	0.08	2.03	0.07	U	0.69	0.43	1.12	0.02	0.01	13	14			
RA-3	13	4/14/99	0828	0.66	<0.05	0.24	0.08	0.14	0.48	0.41	1.03	0.07	0.03	29	28			
	14	5/11/99	0759	0.47	<0.05	0.25	0.07	0.19	0.76	0.71	1.66	0.05	0.03	23	16			
	16	6/15/99	0801	0.56	<0.05	0.44	0.06	U	1.64	0.49	2.13	0.08	0.05	48	40			
	15	7/13/99	0745	0.72	0.09	1	0.07	0.03	1.04	0.52	1.59	0.1	U	61	52			
	14	8/18/99	0844	0.88	0.09	1.95	0.08	U	0.93	0.38	1.31	0.05	0.04	23	17			
	12	9/14/99	0812	0.92	0.08	2.09	0.07	U	0.7	0.44	1.14	0.05	0.01	15	15			
	13.5	10/13/99	0914	0.9	0.09	1.43	0.21	U	U	0.36	0.36	0.04	0.03	24	20			
RA-7	0.1	4/14/99	1000	0.48	<0.05	0.25	0.09	U	0.88	0.52	1.4	0.11	0.05	45	53	0.27		
	0.1	5/12/99	0815	0.62	<0.05	0.39	<0.04	0.03	2.28	0.9	3.21	0.15	0.08	69	22	3.2	0.21	
	0.1	6/15/99	0945	0.7	0.18	3.05	<0.04	U	1.82	0.44	2.26	0.1	0.07	59	13	2.6	0.3	0.61
	0.1	7/13/99	1200	0.67	0.17	3.07	0.07	U	1.07	1.06	2.13	0.11	U	26	18	2.1	0.43	1.19
	0.1	8/18/99	1130	0.86	0.1	2.11	0.07	U	0.73	0.51	1.24	0.04	0.02	15	14	12.4	0.61	1.31
	0.1	9/14/99	1330	0.94	0.07	1.95	0.09	U	0.41	0.53	0.94	0.14	0.02	29	27	5.8	0.37	1.04
	0.1	10/14/99	1000	1	0.1	1.43	0.18	U	0.36	0.54	0.9	0.04	0.01	19	17	12.1	0.49	1.22
RA-7	4	5/12/99	0819	0.21	<0.05	0.12	<0.04	0.04	2.29	0.98	3.31	0.16	0.08	74	20			
	4	7/13/99	1204	0.69	0.2	3.53	0.04	0.19	1.22	0.69	2.1	0.13	0.01	36	12			
	3	9/14/99	1333	1.09	0.07	2.2	0.09	U	0.36	0.58	0.94	0.06	0.02	31	30			
RA-7	7	4/14/99	1007	0.27	<0.05	0.15	0.05	0.03	1.28	0.7	2.01	0.13	0.07	55	47			
	8	5/12/99	0823	0.24	<0.05	0.14	0.05	0.09	2.26	0.95	3.3	0.15	0.09	75	26			
	10	6/15/99	0955	0.79	0.1	2.02	<0.04	0.03	1.33	0.72	2.08	0.14	0.04	80	64			
	9	7/13/99	1209	0.62	0.22	3.41	0.06	0.04	1.44	0.48	1.96	0.1	0.01	49	23			
	7	8/18/99	1137	1.41	0.15	2.67	0.14	0.04	0.59	0.66	1.29	0.13	0.06	71	77			
	7	9/14/99	1337	1.18	0.08	4.09	0.09	0.03	0.38	0.6	1.01	0.15	0.05	33	33			
	7	10/14/99	1007	1.01	0.1	1.38	0.21	0.02	0.32	0.49	0.83	0.05	0.01	20	19			

Station	Depth m	Date mm/dd/yy	Time hhmm	Atraz ug/L	Alach ug/L	Metol ug/L	Cyana ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	TOP mg/L	Turb NTU	TSS mg/L	Chlor ug/L	Secchi m	Phot m
RA-8	0.1	4/14/99	1030	0.11	<0.05	<0.05	<0.04	0.05	0.84	0.89	1.78	0.15	0.08	45	39		0.24	
	0.1	5/12/99	0900	0.23	<0.05	0.14	<0.04	0.32	1.62	1.08	3.02	0.15	0.08	64	21	4.8	0.21	
	0.1	6/15/99	1045	1.91	0.25	6.9	<0.04	U	1.07	0.15	1.22	0.23	0.06	132	50	2	0.15	0.3
	0.1	7/13/99	1330	1.01	0.18	3.02	0.06	U	0.89	0.94	1.83	0.15	U	59	41	8.1	0.27	0.61
	0.1	8/18/99	1230	1.23	0.11	2.12	0.1	U	0.59	0.65	1.24	0.1	0.04	40	31	21.2	0.3	0.73
	0.1	9/14/99	1430	1.11	0.09	1.65	0.08	U	0.18	0.84	1.02	0.09	0.02	38	41	15.5	0.3	0.67
	0.1	10/14/99	0900	1.05	0.09	1.04	0.2	U	U	0.71	0.71	0.08	0.01	18	19	19.1	0.46	1.16
RA-8	3	5/12/99	0903	0.28	<0.05	0.12	0.05	0.22	1.61	1.07	2.9	0.15	0.08	65	26			
	3	7/13/99	1333	0.99	0.19	2.95	0.07	U	1.11	0.88	1.99	0.15	U	60	37			
	2	9/14/99	1432	1.12	0.09	1.51	0.08	U	0.17	0.78	0.95	0.09	0.02	38	43			
RA-8	5	4/14/99	1035	0.06	<0.05	0.06	<0.04	0.08	0.73	1.1	1.91	0.18	0.11	74	68			
	6	5/12/99	0906	1.8	<0.05	0.52	1.21	0.19	1.15	1.48	2.82	0.27	0.11	192	169			
	7	6/15/99	1052	1.85	0.24	4.2	<0.04	0.03	1.56	1.2	2.79	0.25	0.06	159	106			
	6	7/13/99	1336	0.8	0.16	2.83	0.06	U	1.22	0.39	1.61	0.1	0.02	70	20			
	5	8/18/99	1235	1.37	0.11	2.2	0.11	0.02	0.57	0.8	1.39	0.17	0.07	83	86			
	4.5	9/14/99	1435	1.15	0.1	1.66	0.09	U	0.18	0.89	1.07	0.13	0.04	83	94			
	4	10/14/99	0904	1.05	0.09	1.09	0.26	0.02	U	0.79	0.81	0.09	0.01	30	35			
RA-25	0.1	4/14/99	0915	0.71	<0.05	0.38	0.08	U	0.46	0.87	1.33	0.05	0.02	16	15	0.61	1.52	
	0.1	5/11/99	0845	0.56	<0.05	0.27	0.08	0.16	0.81	0.48	1.45	0.05	0.03	26	16	9.6	0.52	1.37
	0.1	6/15/99	0845	1.8	0.06	1.06	0.16	U	1.19	0.64	1.83	0.06	0.02	21	12	9.7	0.58	1.25
	0.1	7/13/99	0930	0.81	0.09	1.82	0.08	0.25	1.14	0.65	2.04	0.06	U	11	7.3	8	0.91	2.13
	0.1	8/18/99	0930	0.72	0.08	1.89	0.08	U	0.82	0.39	1.21	0.03	0.03	13	7	8.2	0.91	2.22
	0.1	9/14/99	1030	0.85	0.06	1.96	0.07	U	0.66	0.51	1.17	0.03	0.01	19	15	7.6	0.52	1.52
	0.1	10/13/99	1100	0.96	0.09	1.39	0.2	U	U	0.48	0.48	0.03	0.01	11	12	15	0.91	2.35
RA-25	5	5/11/99	0850	0.58	<0.05	0.28	0.08	0.18	0.78	0.42	1.38	0.04	0.04	23	15			
	5	7/13/99	0935	0.92	0.11	1.56	0.1	0.35	1	0.5	1.85	0.06	U	16	12			
	4	9/14/99	1034	0.85	0.07	1.91	0.08	0.03	0.68	0.5	1.21	0.06	0.01	19	16			
RA-25	8	4/14/99	0923	0.66	<0.05	0.36	0.07	U	0.43	0.89	1.32	0.06	0.07	25	27			
	10	5/11/99	0855	0.58	<0.05	0.28	0.05	0.24	0.82	0.42	1.48	0.05	0.04	32	30			
	11	6/15/99	0856	1.84	0.06	0.85	0.13	U	1.18	0.87	2.05	0.08	0.03	44	12			
	10	7/13/99	0940	0.88	0.09	1.65	0.09	0.48	1.12	0.58	2.18	0.8	U	51	48			
	8	8/18/99	0938	0.86	0.08	1.87	0.07	0.02	0.9	0.42	1.34	0.04	0.04	23	21			
	7.5	9/14/99	1038	0.76	0.07	1.97	0.07	0.05	0.74	0.49	1.28	0.04	0.01	20	16			
	7.5	10/13/99	1108	0.91	0.09	1.39	0.23	U	U	0.45	0.45	0.03	0.01	12	9			
RA-28	0.1	4/14/99	1130	0.53	<0.05	0.38	0.08	U	0.45	0.8	1.25	0.07	0.04	29	28			
	0.1	5/11/99	1300	0.51	<0.05	0.28	0.06	0.31	0.82	0.18	1.31	0.05	0.03	29	18	3.4		
	0.1	6/15/99	1200	1.5	0.05	0.68	0.07	U	1.84	0.51	2.35	0.07	0.05	37	34			
	0.1	7/13/99	0720	0.77	0.1	1.82	0.1	U	1.25	0.34	1.59	0.07	U	29	9.9	0.3		
	0.1	8/19/99	0715	0.87	0.08	2.09	0.08	0.04	U	0.21	0.25	0.02	U	16	12			
	0.1	9/13/99	1245	0.81	0.06	1.8	0.07	U	0.72	0.51	1.23	0.04	U	12	9			
	0.1	10/14/99	1200	0.95	0.09	1.32	0.2	U	0.55	0.45	1	0.04	U	14	14			

Appendix Table 9. Rathbun Lake 1999 Water Quality/Sediment Data (Part 2)

Station	Depth	Date	Time	SO4 10 20	TOC 0.2 1	DOC 0.2 1	TDS 5 10	VS 5 10	T-FE 40 120	D-FE	T-MN 1 4	D-MN U	COD 3	TS 5	Lab pH	T Alk	Sed pH Top	Sed pH Mid	Sed pH Bot	Sed Temp C
D Lim	R Lim	m	mmddyy	hhmm	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L			mg/L	mg/L	mg/L					
RA-3	0.1	4/14/99	0815																	
RA-3	0.1	5/11/99	0745	23	6.8	6.7	158	29	838	U	49	U				88				
RA-3	0.1	6/15/99	0745																	
RA-3	0.1	7/13/99	0730	25	5.6	6.37	192	87	758	U	24.5	U				7.6	82	6.5	17	
RA-3	0.1	8/18/99	0830	24	6.2	6.1	167	71	360	U	103	29				6.6	90			
RA-3	0.1	9/14/99	0800	17	6.1	6.4	196	81	470	U	47	10				7.8	90	6.8	6.5	
RA-3	0.1	10/13/99	0900	24	5.5	5.5	147	24	675	U	108	24	19			7.6	95			
RA-3	7	5/11/99	0752	23	6.9	6.8	158	114	968	U	58	2				88				
RA-3	10	7/13/99	0740	28	6.3	6.46	186	105	1050	U	33.2	7.1				7.6	84			
RA-3	6	9/14/99	0806	18	7.6	6.1	203	87	614	U	56	U				7.8	90			
RA-3	13	4/14/99	0828																	
RA-3	14	5/11/99	0759	23	7.1	6.5	162	35	1140	U	70	2				90				
RA-3	16	6/15/99	0801																	
RA-3	15	7/13/99	0745	23	5.72	6.1	196	84	2350	U	736	713				7.2	90			
RA-3	14	8/18/99	0844	23	6.1	6.1	159	59	758	U	482	362				6.6	92			
RA-3	12	9/14/99	0812	20	5.9	5.9	153	86	608	U	59	U				7.9	90			
RA-3	13.5	10/13/99	0914	22	5.7	5.5	147	25	872	U	114	25	11			7.5	92			
RA-3-E	15	7/13/99	0745	23		16.83	172	36		1290			4020							
RA-3-E	12	9/14/99	0812	28		8.4	172	116	76		5230									
RA-3-S	15	7/13/99	0745	1199	5827				34000		1370									
RA-3-S	12	9/14/99	0812	<246	10.1			5.92	24900		1280		41.6							
RA-7	0.1	4/14/99	1000																	
RA-7	0.1	5/12/99	0815	19	9.2	7.6	176	44	3331	U	72	3				70				
RA-7	0.1	6/15/99	0945																	
RA-7	0.1	7/13/99	1200	23	6.75	6.87	181	98	1100	U	32	U				8.1	82	6.7	6.9	
RA-7	0.1	8/18/99	1130	20	6	5.9	52	23	410	U	64	3				7.9	85			
RA-7	0.1	9/14/99	1330	21	6.3	6.3	188	78	1080	U	164	19				7.8	94	6.7	6.5	
RA-7	0.1	10/14/99	1000	22	6.3	5.9	141	82	537	U	69	U	20			7.7	94			
RA-7	4	5/12/99	0819	16	11	7.8	160	63	3363	U	75	3				70				
RA-7	4	7/13/99	1204	20	7.9	6.99	188	83	1890	U	58	U				7.7	80			
RA-7	3	9/14/99	1333	22	6.6	6.4	176	69	1040	U	167	18				7.8	92			
RA-7	7	4/14/99	1007																	
RA-7	8	5/12/99	0823	20	8.7	7.7	167	54	3389	U	82	5				73				
RA-7	10	6/15/99	0955																	
RA-7	9	7/13/99	1209	17	6.54	6.95	181	88	2180	U	94.2	14				7.4	84			
RA-7	7	8/18/99	1137	19	6.6	6.5	154	60	3280	U	400	192				94				
RA-7	7	9/14/99	1337	21	7.4	6.6	133	43	998	U	172	20				7.8	92			
RA-7	7	10/14/99	1007	22	6.1	5.8	147	49	500	U	77	5	16			7.9	94			
RA-7-E	9	7/13/99	1209	20		14.06	146	80		1720			1750							
RA-7-E	7	9/14/99	1337	22		7.5	180	84	538		2360									
RA-7-S	9	7/13/99	1209	U	6681				20700		694									
RA-7-S	7	9/14/99	1337	<197	9.3			5.2	20700		572		60.3							

Station D Lim R Lim	Depth m	Date mmddyy	Time hhmm	SO4 10 20 mg/L	TOC 0.2 1 mg/L	DOC 0.2 1 mg/L	TDS 5 10 mg/L	VS 5 10 mg/L	T-FE 40 120 ug/L	D-FE ug/L	T-MN 1 4 mg/L	D-MN 3 109 mg/L	COD 3 167 mg/L	TS 5 mg/L	Lab pH	T Alk mg/L	Sed pH Top	Sed pH Mid	Sed pH Bot	Sed Temp C
RA-8	0.1	4/14/99	1030																	
RA-8	0.1	5/12/99	0900	26	8.2	8.5	183	56	2929	U	76	9							86	
RA-8	0.1	6/15/99	1045			7.4				U		22								
RA-8	0.1	7/13/99	1330	24	6.98	7.21	189	70	2600	U	125	11								
RA-8	0.1	8/18/99	1230	23	5.4	5.4	167	62	1110	U	323	109							7.4	
RA-8	0.1	9/14/99	1430	21	7.5	7.4	204	74	1350	U	396	167							7.8	
RA-8	0.1	10/14/99	0900	23	7.1	7	164	77	648	U	216	5.1	23						6.6	
																			6.5	
RA-8	3	5/12/99	0903	23	8.1	8.2	179	48	2704	U	76	10							84	
RA-8	3	7/13/99	1333	20	6.85	7.38	189	79	2660	U	119	12							7.5	
RA-8	2	9/14/99	1432	28	7.2	7	204	84	1300	U	386	161							86	
																			8	
RA-8	5	4/14/99	1035																112	
RA-8	6	5/12/99	0906	23	10.5	9.6	180	46	8131	44	169	12							74	
RA-8	7	6/15/99	1052			7.4				U		95								
RA-8	6	7/13/99	1336	21	6.64	6.83	193	107	3190	U	121	11							7.2	
RA-8	5	8/18/99	1235	22	6.8	6.8	178	64	2930	U	626	388							86	
RA-8	4.5	9/14/99	1435	26	7.2	35	159	48	2750	U	457	209							7.1	
RA-8	4	10/14/99	0904	25	7.2	7.1	164	79	902	U	233	8	20						110	
																			114	
RA-8-E	6	7/13/99	1336	19			16.32	202	111		290		2050							
RA-8-E	4.5	9/14/99	1435	25			9.5	198	97	476		3450								
RA-8-S	6	7/13/99	1336	U	7662						28800		1025							
RA-8-S	4.5	9/14/99	1435	<271	12.8						32700		1070						42.3	
RA-25	0.1	4/14/99	915																88	
RA-25	0.1	5/11/99	0845	26	6.7	6.5	160	33	470	U	37	1								
RA-25	0.1	6/15/99	0845			5.8				U		U								
RA-25	0.1	7/13/99	0930	22	6.16	6.72	175	142	370	U	13	U							8.3	
RA-25	0.1	8/18/99	0930	22	6.9	6.5	170	70	260	U	38	U							82	
RA-25	0.1	9/14/99	1030	18	9.5	6.2	193	8	690	U	83	6							6.5	
RA-25	0.1	10/13/99	1100	21	6.3	5.8	150	34	340	U	38	U	16						95	
																			8.3	
RA-25	5	5/11/99	0850	29	6.6	6.5	158	146	851	U	47	1							88	
RA-25	5	7/13/99	0935	24	6.32	6.51	189	115	611	U	34.2	U							7.8	
RA-25	4	9/14/99	1034	17	6.3	6.3	174	73	717	U	83	U							84	
																			7.5	
RA-25	8	4/14/99	0923																90	
RA-25	10	5/11/99	0855	26	6.8	6.6	161	30	1390	U	77	6							88	
RA-25	11	6/15/99	0856			6.1				U		31								
RA-25	10	7/13/99	0940	25	6.26	6.45	189	92	2420	U	333	225							7.2	
RA-25	8	8/18/99	0938	21	5.9	5.6	165	87	619	U	184	76							89	
RA-25	7.5	9/14/99	1038	18	6.7	5.8	156	58	780	U	84	U							7.6	
RA-25	7.5	10/13/99	1108	22	6.8	5.7	143	93	320	51	40	U	19						90	
																			8.2	
RA-25E	10	7/13/99	0940	22			15.81	188	52		1090		2970							
RA-25E	7.5	9/14/99	1038	26			6.6	145	44	694		3040								
RA-25S	10	7/13/99	0940	U	6832						12200		583							
RA-25S	7.5	9/14/99	1038	<262	11.8						28300		708						39.8	

Station	Depth	Date	Time	SO4	TOC	DOC	TDS	VS	T-FE	D-FE	T-MN	D-MN	COD	TS	Lab	T Alk	Sed pH Top	Sed pH Mid	Sed pH Bot	Sed Temp
D Lim				10 20	0.2 1	0.2 1	5 10	5 10	40 120		1 4		3	5	pH					
R Lim	m	mmddyy	hhmm	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L		ug/L		mg/L	mg/L		mg/L			C	
RA-28	0.1	4/14/99	1130																	
RA-28	0.1	5/11/99	1300	27	6.7	6.8	157	43	969	U	68	6								
RA-28	0.1	6/15/99	1200																	
RA-28	0.1	7/13/99	0720	32	5.91	6.24	191	111	1100	U	156	102			7.5	82				
RA-28	0.1	8/19/99	0715	21	7.9	5.6	138	67	460	U	147	53			7	90				
RA-28	0.1	9/13/99	1245	19	6.4	6	178	83	470	U	107	5			7.8	88				
RA-28	0.1	10/14/99	1200	23	5.8	5.8	147	211	380	U	57	9	14		7.6	94				

Appendix Table 10. Rathbun Lake Water Quality Data, 1997-1999

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T Orth P mg/L	Turb NTU	TSS mg/L	Chlor ug/L	Secchi m
RA-3	0.1	04/30/1997	0800	2.5	0.06	0.8	<0.1	0.15	1	1	2.15	0.37		15	13	16.7	0.64
	0.1	05/13/1997	0800	2	0.09	0.71	1.49	<0.02	0.8	0.9	1.7	0.16		30	22	6.9	0.34
	0.1	05/27/1997	1145	2	<0.05	3.99	1.86	0.1	0.85	1.1	2.05	0.14	0.03	26	12		
	0.1	06/08/1997	1245	1.89	0.07	0.63	<0.1	0.3	0.81	1.2	2.31	0.09	0.07	25	21		
	0.1	06/23/1997	1405	2.38	0.41	0.76	1.52	0.02	0.91	0.9	1.83	0.15	0.03	18	8		
	0.1	07/07/1997	1406	2.15	0.07	0.65	1.38	0.02	0.73	0.5	1.25	0.05	0.05	12	13		
	0.1	07/21/1997	1410	2.99	0.17	1.21	1.39	0.02	0.56	0.6	1.18	0.08	0.02	5.2	5		
	0.1	08/04/1997	1351	2.52	0.09	0.93	1.26	0.07	0.27	0.9	1.24	0.18	0.02	6	7		
	0.1	09/02/1997	1415	2.32	<0.05	0.64	1.25	<0.02	0.24	1.2	1.44	0.05	0.03	5	6		
	0.1	09/15/1997	1245	3.2	0.09	0.7	1.43	0.11	0.22	0.7	1.03	0.07	0.04	5	5		
RA-3	0.1	04/14/1998	1115	1.02	<0.05	0.27	0.46	0.03	0.5	0.9	1.43	0.06	0.05	25	17		0.4
	0.1	05/04/1998	0915	0.74	<0.05	0.22	0.46	0.04	0.61	0.4	1.05	0.07	0.01	17	7		0.67
	0.1	05/18/1998	1515	1.05	<0.05	0.2	0.5	0.09	0.62	0.6	1.31	0.07	0.03	12	3		1.07
	0.1	06/09/1998	1810	1.63	0.13	0.66	0.44	0.14	0.73	0.6	1.47	0.19	0.04	18	10		0.58
	0.1	06/22/1998	1510	1.71	<0.05	0.44	0.45	0.05	0.7	0.8	1.55	0.1	0.03	14	4		0.79
	0.1	07/06/1998	1310	1.44	0.1	0.85	0.28	0.46	0.81	0.5	1.77	0.19	0.01	10	5		1.04
	0.1	07/20/1998	1500	1.05	0.12	1.48	0.18	0.05	0.49	0.5	1.04	0.33	0.03	5.7	5		1.16
	0.1	08/03/1998	0845	0.81	0.07	1.12	0.11	<0.02	0.57	0.3	0.87	0.06	0.03	7.3	5		3.5
	0.1	08/03/1998	1400											12	12		
	0.1	08/17/1998	0915	1.1	0.11	1.1	0.15	0.04	0.45	0.6	1.09	0.11	0.02	8.5	6		1.07
	0.1	08/31/1998	1200	0.94	0.12	1.23	0.12	0.05	0.26	0.9	1.21	0.04	0.03	6.7	7		1.07
	0.1	09/13/1998	0930	1.08	0.09	1.07	0.12	0.06	0.26	0.6	0.92	0.09	0.03	7	5		1.13
RA-3	0.1	04/14/1999	0815	0.66	0.05	0.34	0.09	U	0.46	0.39	0.85	0.06	0.03	18	15		0.46
	0.1	05/11/1999	0745	0.52	<0.05	0.3	0.08	0.19	0.81	0.5	1.5	0.04	0.02	20	13		4.2
	0.1	06/15/1999	0745	1.31	0.08	1.02	0.11	U	1.23	0.62	1.85	0.06	0.03	24	9.3		6.2
	0.1	07/13/1999	0730	0.79	0.09	1.7	0.06	U	1.01	0.68	1.69	0.07	U	17	8.1		2.4
	0.1	08/18/1999	0830	0.85	0.09	2.02	0.07	U	0.96	0.39	1.35	0.05	0.03	12	9		0.88
	0.1	09/14/1999	0800	0.91	0.06	2.12	0.09	U	0.68	0.42	1.1	0.01	0.01	11	14		0.82
	0.1	10/13/1999	0900	0.97	0.11	1.37	0.22	0.07	U	0.32	0.39	0.04	0.01	17	17		0.61
RA-3	14	04/30/1997	0814	2.43	0.07	0.69	1.95	0.09	0.8	0.6	1.49	0.11		27	20		
	15	05/13/1997	0815	1.97	0.06	0.75	1.44	<0.02	0.79	0.9	1.69	0.17		32	27		
	15	05/27/1997	1200	1.78	0.05	0.7	2.02	0.13	0.86	1	1.99	0.13	0.03	28	16		
	14.5	06/08/1997	1300	2.11	0.09	0.79	0.9	0.24	0.96	1.1	2.3	0.11	0.08	47	32		
	14.5	06/23/1997	1420	2.4	0.53	0.61	1.55	0.03	0.96	0.9	1.89	0.11	0.06	72	55		
	13	07/07/1997	1419	2.03	0.08	0.68	1.48	0.15	0.75	0.7	1.6	0.07	0.06	56	38		
	13	07/21/1997	1423	2.38	0.1	0.97	1.25	0.09	0.67	0.6	1.36	0.16	0.03	39	30		
	13	08/04/1997	1404	2.35	0.12	0.75	1.15	0.53	0.16	1.1	1.79	0.21	0.03	27	28		
	13	09/02/1997	1428	2.21	<0.05	0.68	1.24	0.1	0.42	1.1	1.62	0.07	0.03	19	21		
	13	09/15/1997	1258	2.53	0.08	0.56	1.34	0.1	0.24	1.5	1.84	0.18	0.15	13	14		

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T Orth P mg/L	Turb NTU	TSS mg/L	Chlor ug/L	Secchi m
RA-3	17.5	04/14/1998	1133	1.28	0.05	0.29	0.53	0.06	0.49	1.1	1.65	0.05	0.05	30	25		
	17	05/04/1998	0932	0.79	<0.05	0.21	0.41	0.07	0.59	0.4	1.06	0.04	0.02	20	7		
	17	05/18/1998	1532	0.88	<0.05	0.21	0.47	0.13	0.59	0.7	1.42	0.05	0.03	15	6		
	17	06/09/1998	1827	1.29	0.07	0.44	0.46	0.1	0.74	0.6	1.44	0.09	0.06	39	27		
	18	06/22/1998	1528	1.71	0.05	0.42	0.47	0.5	0.7	0.8	2	0.19	0.05	36	17		
	17	07/06/1998	1327	1.67	0.08	0.57	0.42	0.52	0.88	0.6	2	0.07	0.01	35	14		
	16.5	07/20/1998	1517	0.73	0.09	0.8	0.12	0.07	0.77	0.4	1.24	0.22	0.05	29	15		
	16	08/03/1998	0901	0.81	0.12	1.07	0.11	0.07	0.61	0.3	0.98	0.03	0.01	25	18		
	16	08/17/1998	0931	1.05	0.06	<0.05	0.12	0.12	0.41	0.2	0.73	0.11	0.02	12	10		
	15.5	08/31/1998	1216	0.95	0.06	1.3	0.14	0.29	0.11	1	1.4	0.03	0.03	21	18		
	15	09/13/1998	0945	1.03	<0.05	1.09	0.13	0.11	0.25	0.6	0.96	0.09	0.02	15	15		
RA-3	7	05/11/1999	0752	0.6	<0.05	0.29	0.08	0.24	0.78	0.39	1.41	0.06	0.04	24	20		
	10	07/13/1999	0740	0.81	0.11	1.73	0.06	U	1.04	0.7	1.74	0.08	U	25	24		
	6	09/14/1999	0806	0.91	0.08	2.03	0.07	U	0.69	0.43	1.12	0.02	0.01	13	14		
RA-3	13	04/14/1999	0828	0.66	<0.05	0.24	0.08	0.14	0.48	0.41	1.03	0.07	0.03	29	28		
RA-3	14	05/11/1999	0759	0.47	<0.05	0.25	0.07	0.19	0.76	0.71	1.66	0.05	0.03	23	16		
RA-3	16	06/15/1999	0801	0.56	<0.05	0.44	0.06	U	1.64	0.49	2.13	0.08	0.05	48	40		
RA-3	15	07/13/1999	0745	0.72	0.09	1	0.07	0.03	1.04	0.52	1.59	0.1	U	61	52		
RA-3	14	08/18/1999	0844	0.88	0.09	1.95	0.08	U	0.93	0.38	1.31	0.05	0.04	23	17		
RA-3	12	09/14/1999	0812	0.92	0.08	2.09	0.07	U	0.7	0.44	1.14	0.05	0.01	15	15		
RA-3	13.5	10/13/1999	0914	0.9	0.09	1.43	0.21	U	U	0.36	0.36	0.04	0.03	24	20		
RA-7	0.1	04/30/1997	0915	1.13	<0.05	0.28	0.63			0				69	49	15.5	0.24
	0.1	05/13/1997	1000	0.7	<0.1	0.3	<0.1	0.04	1.62	1.3	2.96	0.19		65	31	16.9	0.18
	0.1	05/27/1997	1415	1.84	<0.05	0.93	1.05	0.08	1.31	1.2	2.59	0.09	0.05	69	33		
	0.1	06/08/1997	1440	2.01	0.09	1.05	1.06	0.23	1.33	1.3	2.86	0.1	0.08	61	31		
	0.1	06/23/1997	1615	2.44	0.51	1.34	<0.1	<0.02	1.36	0.8	2.16	0.09	0.05	36	15		
	0.1	07/07/1997	1706	3.19	0.17	1.5	1.39	1.02	0.86	1.1	2.98	0.08	0.05	27	28		
	0.1	07/21/1997	1530	3.52	0.16	1.83	1.48	0.03	0.49	0.8	1.32	0.15	0.03	15	14		
	0.1	08/04/1997	1508	6.7	0.21	2.18	1.53	0.08	0.17	1.3	1.55	0.42	0.03	9	13		
	0.1	09/02/1997	1535	2.49	<0.05	0.88	1.26	<0.02	0.17	1.2	1.37	0.06	0.03	11	12		
	0.1	09/15/1997	1400	2.79	0.12	0.67	1.4	0.1	0.08	1.3	1.48	0.08	0.04	13	16		
RA-7	0.1	04/14/1998	1220	0.12	<0.05	0.13	0.05	0.18	0.84	1.3	2.32	0.14	0.08	114	25		0.15
	0.1	05/04/1998	1010	0.37	<0.05	0.21	0.15	0.09	0.72	0.7	1.51	0.13	0.05	72	14		0.2
	0.1	05/18/1998	1600	1	0.05	0.35	0.29	0.12	0.63	0.6	1.35	0.11	0.06	28	4		0.58
	0.1	06/09/1998	1910	6.7	0.16	2.43	0.63	0.01	0.98	0.4	1.39	0.13	0.09	49	12		0.3
	0.1	06/22/1998	1600	12.6	0.21	2.65	1.03	0.06	1.32	1.2	2.58	0.18	0.09	50	13		0.27
	0.1	07/06/1998	1350	0.74	0.12	1.7	0.09	0.06	0.97	1	2.03	0.1	0.02	17	9		0.7
	0.1	07/20/1998	1550	0.96	0.14	1.71	0.13	0.07	0.69	0.9	1.66	0.19	0.03	13	8		0.73
	0.1	08/03/1998	0945	0.91	0.13	1.88	0.12	0.03	0.57	0.5	1.1	0.31	0.02	16	16		1.7
	0.1	08/17/1998	1015	1.11	0.08	1.6	0.1	0.02	0.39	0.6	1.01	0.16	0.02	13.7	15		0.79
	0.1	08/31/1998	1245	1.02	0.08	1.42	0.13	0.02	0.18	0.8	1	0.03	0.03	17	18		0.55
	0.1	09/13/1998	1015	1.07	0.05	1.39	0.1	0.06	0.12	0.6	0.78	0.1	0.03	19	14		0.52

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T Orth P mg/L	Turb NTU	TSS mg/L	Chlor ug/L	Secchi m
RA-7	0.1	04/14/1999	1000	0.48	<0.05	0.25	0.09	U	0.88	0.52	1.4	0.11	0.05	45	53	0.27	
RA-7	0.1	05/12/1999	0815	0.62	<0.05	0.39	<0.04	0.03	2.28	0.9	3.21	0.15	0.08	69	22	3.2	0.21
RA-7	0.1	06/15/1999	0945	0.7	0.18	3.05	<0.04	U	1.82	0.44	2.26	0.1	0.07	59	13	2.6	0.3
RA-7	0.1	07/13/1999	1200	0.67	0.17	3.07	0.07	U	1.07	1.06	2.13	0.11	U	26	18	2.1	0.43
RA-7	0.1	08/18/1999	1130	0.86	0.1	2.11	0.07	U	0.73	0.51	1.24	0.04	0.02	15	14	12.4	0.61
RA-7	0.1	09/14/1999	1330	0.94	0.07	1.95	0.09	U	0.41	0.53	0.94	0.14	0.02	29	27	5.8	0.37
RA-7	0.1	10/14/1999	1000	1	0.1	1.43	0.18	U	0.36	0.54	0.9	0.04	0.01	19	17	12.1	0.49
RA-7	8.5	04/30/1997	0924	0.89	0.05	0.26	0.51	0.28	0.91	1.1	2.29	0.16		96	72		
	8	05/13/1997	1008	1.67	0.11	0.74	1.44	0.15	1.24	1	2.39	0.16		52	26		
	7	05/27/1997	1422	1.88	0.11	0.75	1.39	0.09	1.13	1.2	2.42	0.16	0.05	70	46		
	7	06/08/1997	1447	2.63	0.16	1.11	0.57	0.13	1.57	1.5	3.2	0.18	0.14	122	58		
	6.5	06/23/1997	1622	2.36	0.42	0.89	1.14	0.05	0.95	1.1	2.1	0.15	0.06	65	44		
	6.5	07/07/1997	1713	3.46	0.26	1.43	1.43	0.02	0.89	0.7	1.61	0.2	0.06	49	39		
	6.5	07/21/1997	1537	3.39	0.17	1.6	1.3	0.11	0.53	1.1	1.74	0.17	0.04	42	40		
	6.5	08/04/1997	1515	2.74	0.1	1.03	1.25	0.25	0.29	1.3	1.84	0.2	0.03	32	36		
	6.1	08/20/1997		5.2	<0.1	<0.1	1.2	0.26	0.34	1.5	2.1	0.26					
	6.5	09/02/1997	1542	3.08	<0.05	1.12	1.23	0.04	0.51	1	1.55	0.12	0.05	38	34		
	6.5	09/15/1997	1407	3.19	0.13	0.92	1.31	0.11	0.35	1	1.46	0.14	0.08	48	41		
RA-7	10.5	04/14/1998	1231	0.8	<0.05	0.25	0.34	0.07	0.61	1	1.68	0.06	0.05	60	33		
	10.5	05/04/1998	1021	0.85	<0.05	0.26	0.42	0.09	0.62	0.4	1.11	0.06	0.02	35	9		
	10.5	05/18/1998	1611	0.94	0.07	0.27	0.31	0.45	0.64	0.7	1.79	0.54	0.07	45	7		
	10.5	06/09/1998	1921	2.93	0.14	1.3	0.45	0.01	0.85	0.5	1.36	0.08	0.07	39	19		
	11	06/22/1998	1611	9.4	0.14	2.38	1.05	0.05	1.35	1	2.4	0.16	0.11	51	9		
	10.5	07/06/1998	1401	0.5	0.23	2.48	0.06	<0.02	1.32	0.5	1.82	0.22	0.15	39	12		
	10	07/20/1998	1600	0.72	0.16	1.79	0.1	0.08	0.86	0.6	1.54	0.17	0.06	46	26		
	9.5	08/03/1998	0955	0.99	0.16	1.78	0.1	0.04	0.65	0.5	1.19	0.07	0.03	31	29		
	9	08/17/1998	1024	1.21	0.09	1.98	0.13	0.06	0.51	0.7	1.27	0.18	0.03	30	25		
	8	08/31/1998	1253	1.03	0.09	1.71	0.14	0.13	0.23	0.6	0.96	0.12	0.04	31	27		
	8	09/13/1998	1023	1.21	0.09	1.4	0.12	0.13	0.28	0.9	1.31	0.2	0.08	62	60		
RA-7	4	05/12/1999	0819	0.21	<0.05	0.12	<0.04	0.04	2.29	0.98	3.31	0.16	0.08	74	20		
RA-7	4	07/13/1999	1204	0.69	0.2	3.53	0.04	0.19	1.22	0.69	2.1	0.13	0.01	36	12		
RA-7	3	09/14/1999	1333	1.09	0.07	2.2	0.09	U	0.36	0.58	0.94	0.06	0.02	31	30		
RA-7	7	04/14/1999	1007	0.27	<0.05	0.15	0.05	0.03	1.28	0.7	2.01	0.13	0.07	55	47		
RA-7	8	05/12/1999	0823	0.24	<0.05	0.14	0.05	0.09	2.26	0.95	3.3	0.15	0.09	75	26		
RA-7	10	06/15/1999	0955	0.79	0.1	2.02	<0.04	0.03	1.33	0.72	2.08	0.14	0.04	80	64		
RA-7	9	07/13/1999	1209	0.62	0.22	3.41	0.06	0.04	1.44	0.48	1.96	0.1	0.01	49	23		
RA-7	7	08/18/1999	1137	1.41	0.15	2.67	0.14	0.04	0.59	0.66	1.29	0.13	0.06	71	77		
RA-7	7	09/14/1999	1337	1.18	0.08	4.09	0.09	0.03	0.38	0.6	1.01	0.15	0.05	33	33		
RA-7	7	10/14/1999	1007	1.01	0.1	1.38	0.21	0.02	0.32	0.49	0.83	0.05	0.01	20	19		

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T Orth P mg/L	Turb NTU	TSS mg/L	Chlor ug/L	Secchi m
RA-8	0.1	04/30/1997	1000	0.26	<0.05	<0.05	0.12	0.21	1.33	1.1	2.64	0.13		68	52	11.3	0.21
	0.1	05/13/1997	1105	1.55	0.07	1.44	0.52	0.3	1.25	1.5	3.05	0.16		78	44	12.3	0.15
	0.1	05/27/1997	1330	80	<0.1	2.2	<0.1	0.22	0.9	1.6	2.72	0.19	0.08	86	79		
	0.1	06/08/1997	1400	2.67	0.12	1.54	0.76	0.03	0.54	0.14	0.71	0.1	0.08	48	49		
	0.1	06/23/1997	1525	12.4	0.75	2.76	2.59	0.04	0.84	1.4	2.28	0.15	0.04	34	40		
	0.1	07/07/1997	1541	17.1	<0.1	<0.1	4	0.29	1.45	1.6	3.34	0.08	0.07	73	76		
	0.1	07/21/1997	1506	7.95	0.25	1.74	1.68	0.06	0.63	1	1.69	0.13	0.03	23	23		
	0.1	08/04/1997	1436	5.44	0.4	1.59	2.83	0.12	0.09	1.8	2.01	0.29	0.04	26	38		
	0.1	09/02/1997	1610	3.8	<0.05	<0.1	0.37	<0.02	0.68	1.3	1.98	0.13	0.05	45	32		
	0.1	09/15/1997	1440	2.82	0.09	0.65	1.17	0.06	0.26	1	1.32	0.11	0.06	20	17		
RA-8	0.1	04/14/1998	1310	0.17	<0.05	0.13	0.05	0.18	0.49	1.5	2.17	0.13	0.09	181	90		0.15
	0.1	05/04/1998	1045	0.24	<0.05	0.14	0.1	0.14	0.53	0.6	1.27	0.06	0.05	52	16		0.27
	0.1	05/18/1998	1640	4.8	0.14	3.17	0.43	0.2	0.86	1.2	2.26	0.34	0.1	62	17		0.24
	0.1	06/09/1998	1945	12.8	0.31	4.03	0.65	0.04	1.06	1.1	2.2	0.11	0.1	60	19		0.24
	0.1	06/22/1998	1640	16.7	0.22	3.36	1.3	0.07	1.65	1.6	3.32	0.13	0.1	52	20		0.27
	0.1	07/06/1998	1425	0.8	0.21	2.5	0.07	0.09	1.25	0.6	1.94	0.09	0.06	30	10		0.43
	0.1	07/20/1998	1640	1.54	0.13	1.79	0.15	0.06	0.26	0.7	1.02	0.16	0.03	15	9		0.73
	0.1	08/03/1998	1015	1.6	0.13	1.58	0.14	0.11	0.16	0.6	0.87	0.05	0.03	19	18		1.4
	0.1	08/17/1998	1050	2.14	0.1	1.3	0.19	0.05	0.06	0.9	1.01	0.2	0.02	20	18		0.46
	0.1	08/31/1998	1315	1.43	0.08	1.21	0.16	0.08	0.12	0.8	1	0.08	0.03	29	31		0.36
RA-8	0.1	09/13/1998	1100	2.02	0.09	0.9	0.16	0.09	0.07	1	1.16	0.17	0.04	26	22		0.4
	0.1	04/14/1999	1030	0.11	<0.05	<0.05	<0.04	0.05	0.84	0.89	1.78	0.15	0.08	45	39		0.24
	0.1	05/12/1999	0900	0.23	<0.05	0.14	<0.04	0.32	1.62	1.08	3.02	0.15	0.08	64	21	4.8	0.21
	0.1	06/15/1999	1045	1.91	0.25	6.9	<0.04	U	1.07	0.15	1.22	0.23	0.06	132	50	2	0.15
	0.1	07/13/1999	1330	1.01	0.18	3.02	0.06	U	0.89	0.94	1.83	0.15	U	59	41	8.1	0.27
	0.1	08/18/1999	1230	1.23	0.11	2.12	0.1	U	0.59	0.65	1.24	0.1	0.04	40	31	21.2	0.3
	0.1	09/14/1999	1430	1.11	0.09	1.65	0.08	U	0.18	0.84	1.02	0.09	0.02	38	41	15.5	0.3
RA-8	0.1	10/14/1999	0900	1.05	0.09	1.04	0.2	U	U	0.71	0.71	0.08	0.01	18	19	19.1	0.46
	5.5	04/30/1997	1006	0.59	0.1	0.13	0.25	0.4	1.2	1.3	2.9	0.16		129	106		
	4.5	05/13/1997	1110	2.52	0.1	1.92	0.83	0.27	1.17	1.6	3.04	0.18		115	80		
	5	05/27/1997	1335	2.51	0.15	1.49	1.21	0.21	0.93	1.7	2.84	0.15	0.09	97	80		
	4	06/08/1997	1404	3.11	0.18	1.59	0.77	0.06	0.46	1.6	2.12	0.14	0.08	79	87		
	4	06/23/1997	1529	3.63	0.39	1.28	1.62	0.04	0.84	1.1	1.98	0.21	0.07	88	86		
	4	07/07/1997	1545	14.7	0.19	3.34	2.97	0.37	1.52	1.3	3.19	0.09	0.09	115	115		
	4	07/21/1997	1510	4.82	0.27	2.14	2.03	0.12	0.64	1	1.76	0.15	0.04	57	61		
	4	08/04/1997	1440	4.39	0.13	1.43	1.88	0.09	0.14	1.6	1.83	0.26	0.07	75	80		
	6.1	08/20/1997		5.2	<0.1	<0.1	0.9	0.03	0.28	0.6	0.91	0.15			178		
4	09/02/1997	1614	2.22	<0.05	0.74	0.78	0.19	0.64	1.6	2.43	0.4	0.1	100	86			
	4	09/15/1997	1444	2.4	0.1	0.6	0.94	0.12	0.41	1.2	1.73	0.19	0.1	74	77		

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T Orth P mg/L	Turb NTU	TSS mg/L	Chlor ug/L	Secchi m
RA-8	8	04/14/1998	1318	0.09	<0.05	0.14	0.06	0.2	0.5	1.6	2.3	0.16	0.1	250	158		
	8	05/04/1998	1053	0.39	<0.05	0.16	0.19	0.17	0.57	0.3	1.04	0.12	0.05	55	17		
	8	05/18/1998	1648	1.32	0.09	0.51	0.46	0.15	0.6	0.6	1.35	0.12	0.06	29	10		
	8	06/09/1998	1953	11.9	0.21	3.76	0.61	0.1	1.23	0.8	2.13	0.14	0.1	77	40		
	8.5	06/22/1998	1649	9.1	0.12	2.49	0.75	0.12	1.11	1.3	2.53	0.19	0.1	60	28		
	8.5	07/06/1998	1434	2.79	0.29	2.43	0.31	0.29	0.88	0.8	1.97	0.28	0.07	56	35		
	7.5	07/20/1998	1648	1.63	0.18	2.56	0.18	0.48	0.26	1.1	1.84	0.23	0.16	109	92		
	7	08/03/1998	1022	1.61	0.15	1.46	0.13	0.22	0.15	0.8	1.17	0.13	0.05	54	57		
	6.5	08/17/1998	1057	1.34	0.08	1.46	0.14	0.14	0.31	0.8	1.25	0.22	0.03	40	39		
	6	08/31/1998	1321	1.84	0.08	1.3	0.17	0.15	0.22	1.3	1.67	0.14	0.07	77	100		
	5	09/13/1998	1105	1.62	0.06	0.95	0.15	0.26	0.16	1.2	1.62	0.2	0.08	60	67		
RA-8	3	05/12/1999	0903	0.28	<0.05	0.12	0.05	0.22	1.61	1.07	2.9	0.15	0.08	65	26		
RA-8	3	07/13/1999	1333	0.99	0.19	2.95	0.07	U	1.11	0.88	1.99	0.15	U	60	37		
RA-8	2	09/14/1999	1432	1.12	0.09	1.51	0.08	U	0.17	0.78	0.95	0.09	0.02	38	43		
RA-8	5	04/14/1999	1035	0.06	<0.05	0.06	<0.04	0.08	0.73	1.1	1.91	0.18	0.11	74	68		
RA-8	6	05/12/1999	0906	1.8	<0.05	0.52	1.21	0.19	1.15	1.48	2.82	0.27	0.11	192	169		
RA-8	7	06/15/1999	1052	1.85	0.24	4.2	<0.04	0.03	1.56	1.2	2.79	0.25	0.06	159	106		
RA-8	6	07/13/1999	1336	0.8	0.16	2.83	0.06	U	1.22	0.39	1.61	0.1	0.02	70	20		
RA-8	5	08/18/1999	1235	1.37	0.11	2.2	0.11	0.02	0.57	0.8	1.39	0.17	0.07	83	86		
RA-8	4.5	09/14/1999	1435	1.15	0.1	1.66	0.09	U	0.18	0.89	1.07	0.13	0.04	83	94		
RA-8	4	10/14/1999	0904	1.05	0.09	1.09	0.26	0.02	U	0.79	0.81	0.09	0.01	30	35		
RA-25	0.1	04/14/1999	0915	0.71	<0.05	0.38	0.08	U	0.46	0.87	1.33	0.05	0.02	16	15	0.61	
RA-25	0.1	05/11/1999	0845	0.56	<0.05	0.27	0.08	0.16	0.81	0.48	1.45	0.05	0.03	26	16	9.6	
RA-25	0.1	06/15/1999	0845	1.8	0.06	1.06	0.16	U	1.19	0.64	1.83	0.06	0.02	21	12	9.7	
RA-25	0.1	07/13/1999	0930	0.81	0.09	1.82	0.08	0.25	1.14	0.65	2.04	0.06	U	11	7.3	8	
RA-25	0.1	08/18/1999	0930	0.72	0.08	1.89	0.08	U	0.82	0.39	1.21	0.03	0.03	13	7	8.2	
RA-25	0.1	09/14/1999	1030	0.85	0.06	1.96	0.07	U	0.66	0.51	1.17	0.03	0.01	19	15	7.6	
RA-25	0.1	10/13/1999	1100	0.96	0.09	1.39	0.2	U	U	0.48	0.48	0.03	0.01	11	12	15	
RA-25	5	05/11/1999	0850	0.58	<0.05	0.28	0.08	0.18	0.78	0.42	1.38	0.04	0.04	23	15		
RA-25	5	07/13/1999	0935	0.92	0.11	1.56	0.1	0.35	1	0.5	1.85	0.06	U	16	12		
RA-25	4	09/14/1999	1034	0.85	0.07	1.91	0.08	0.03	0.68	0.5	1.21	0.06	0.01	19	16		
RA-25	8	04/14/1999	0923	0.66	<0.05	0.36	0.07	U	0.43	0.89	1.32	0.06	0.07	25	27		
RA-25	10	05/11/1999	0855	0.58	<0.05	0.28	0.05	0.24	0.82	0.42	1.48	0.05	0.04	32	30		
RA-25	11	06/15/1999	0856	1.84	0.06	0.85	0.13	U	1.18	0.87	2.05	0.08	0.03	44	12		
RA-25	10	07/13/1999	0940	0.88	0.09	1.65	0.09	0.48	1.12	0.58	2.18	0.8	U	51	48		
RA-25	8	08/18/1999	0938	0.86	0.08	1.87	0.07	0.02	0.9	0.42	1.34	0.04	0.04	23	21		
RA-25	7.5	09/14/1999	1038	0.76	0.07	1.97	0.07	0.05	0.74	0.49	1.28	0.04	0.01	20	16		
RA-25	7.5	10/13/1999	1108	0.91	0.09	1.39	0.23	U	U	0.45	0.45	0.03	0.01	12	9		

Station	Depth m	Date mm/dd/yyyy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	NH3 mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	TP mg/L	T Orth P mg/L	Turb NTU	TSS mg/L	Chlor ug/L	Secchi m
RA-28	0.1	04/30/1997	1215	<0.05	<0.05	<0.05	<0.04	0.4	0.6	0.6	1.6	0.19		23	19		
	0.1	05/12/1997	1445	2.11	0.07	0.76	1.61	0.02	0.77	0.9	1.69	0.13		31	24		
	0.1	05/27/1997	0930	2.2	0.11	3.93	1.81	0.1	0.85	0.9	1.85	0.07	0.04	28	12		
	0.1	06/08/1997	1320	2.11	0.05	0.62	1.43	0.04	0.92	1.1	2.06	0.13	0.08	39	22		
	0.1	06/23/1997	1020	2.4	0.52	0.7	1.49	0.02	0.95	0.9	1.87	0.14	0.06	36	19		
	0.1	07/07/1997	1045	2.23	0.11	0.64	1.4	0.09	0.75	0.5	1.34	0.16	0.06	37	24		
	0.1	07/21/1997	1010	2.37	0.14	1.08	1.27	0.24	0.63	0.9	1.77	0.2	0.05	59	56		
	0.1	08/04/1997	1000	2.28	0.1	0.8	1.4	0.22	0.25	0.4	0.87	0.31	0.03	21	24		
	0.1	09/02/1997	1000	1.88	<0.05	0.6	1.2	0.14	0.35	1.2	1.69	0.15	0.04	20	20		
	0.1	09/15/1997	0920	2.47	0.11	0.63	1.35	0.09	0.51	0.8	1.4	0.08	0.05	14	15		
RA-28	0.1	04/14/1998	1445	0.99	<0.05	0.29	0.51							28	20		
	0.1	05/04/1998	1150	0.93	<0.05	0.25	0.46	0.05	0.6	0.6	1.25	0.12	0.03	19	5		
	0.1	05/18/1998	1840	1.16	0.06	0.25	0.49	0.11	0.62	0.4	1.13	0.03	0.03	16	5		
	0.1	06/09/1998	1715	1.41	0.06	0.48	0.45	<0.02	0.62	0.5	1.12	0.15	0.14	28	17		
	0.1	06/22/1998	1740	1.72	0.1	0.44	0.48	0.06	0.73	0.8	1.59	0.07	0.04	23	9		
	0.1	07/06/1998	1100	1.3	0.11	0.78	0.25	0.04	0.86	0.4	1.3	0.04	0.03	20	9		
	0.1	07/20/1998	1745	0.9	0.12	1	0.16	0.06	0.78	0.3	1.14	0.23	0.04	18	6		
	0.1	08/03/1998	1120	0.93	0.09	1.22	0.13	0.07	0.58	0.5	1.15	0.13	0.03	21	17		
	0.1	08/17/1998	1210	1.11	0.06	1.17	0.15	0.06	0.45	0.5	1.01	0.14	0.01	12	8		
	0.1	08/31/1998	1035	0.98	0.09	1.15	0.14	0.02	0.03	0.4	0.45	0.06	0.02	12	11		
RA-28	0.1	09/13/1998	1200	1.22	<0.05	1.11	0.13	0.09	0.19	0.2	0.48	0.04	0.02	11	10		
	0.1	04/14/1999	1130	0.53	<0.05	0.38	0.08	U	0.45	0.8	1.25	0.07	0.04	29	28		
	0.1	05/11/1999	1300	0.51	<0.05	0.28	0.06	0.31	0.82	0.18	1.31	0.05	0.03	29	18	3.4	
	0.1	06/15/1999	1200	1.5	0.05	0.68	0.07	U	1.84	0.51	2.35	0.07	0.05	37	34		
	0.1	07/13/1999	0720	0.77	0.1	1.82	0.1	U	1.25	0.34	1.59	0.07	U	29	9.9	0.3	
	0.1	08/19/1999	0715	0.87	0.08	2.09	0.08	0.04	U	0.21	0.25	0.02	U	16	12		
	0.1	09/13/1999	1245	0.81	0.06	1.8	0.07	U	0.72	0.51	1.23	0.04	U	12	9		
RA-28	0.1	10/14/1999	1200	0.95	0.09	1.32	0.2	U	0.55	0.45	1	0.04	U	14	14		